SUGAR

AZUCAR

FEBRUARY 1957

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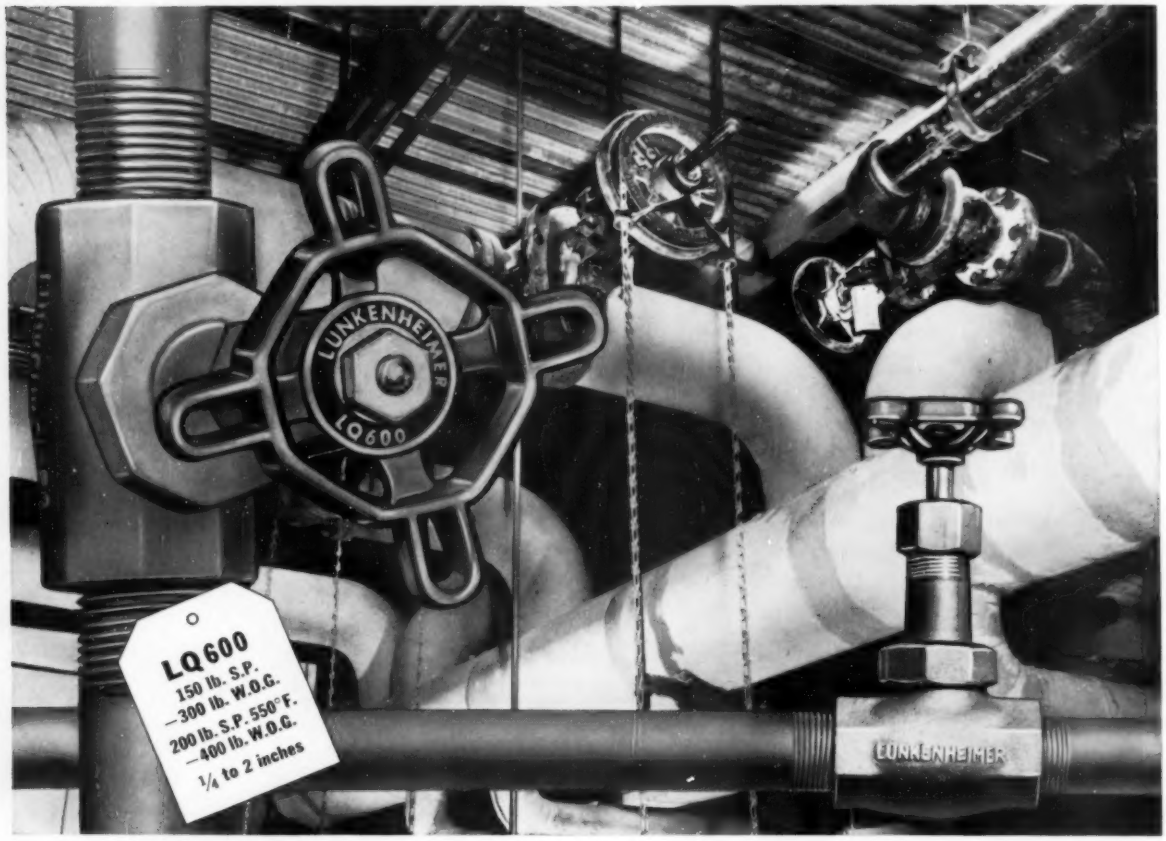
Today, maintenance often costs more than the equipment itself!

You Can't Afford Less than the Best



What's happened to maintenance costs? That's a question you hear time and again in management-maintenance meetings these days. Costs are up sky-high and labor rates are still rising. The minute you touch a wrench to a valve, its cost can more than double! You can't do anything about the labor costs, but you can cut maintenance expense to rock-bottom by installing the one bronze globe valve that's handwheel-and-bonnet above all others . . . the LQ600, by Lunkenheimer. Thousands of these valves have served without maintenance for five years and more—many on the toughest throttling services industry can offer. The secret? Exclusive Brinalloy* seats and discs—harder than 500 Brinell Stainless! Insist on LQ600 Valves to help solve your number-one problem . . . sky-high maintenance expense. The Lunkenheimer Co., Box 360, Cincinnati 14, Ohio.

The cost of a LUNKENHEIMER VALVE
Gets smaller... and smaller... *and smaller...*
with each passing year of dependable service

**Patented alloy—T. M. Reg.*

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LUNKENHEIMER®

THE ONE *Great* NAME IN VALVES

Factory	Country	Diameter	Factory	Country	Diameter
19. Tentativa	Angola	18	41. Juanita	Puerto Rico	30
20. Porters	Barbados	12	42. Phetchburi	Thailand	12
21. Ozama	Dom. Rep.	22	43. Tamazula	Mexico	20
22. Monte Llano	Dom. Rep.	16	44. Paia	Hawaii	22
23. Ugar	India	18	45. La Joya	Mexico	20
24. Koregaon	India	16	46. Ledesma	Argentina	30
25. Malegaon	India	16	47. Ledesma	Argentina	20
26. Rahuri	India	16	48. Concepcion	Argentina	26
27. Rahata	India	16	49. Namakia	Madagascar	16
28. Sri Khedut	India	16	50. National	India	13
29. Sri Rama	India	16	51. Cartavio	Peru	20
30. Queimado	Brazil	16	52. North Arcot	India	16
31. Ressouvenir	Br. Guiana	20	53. Amaravati	India	16
32. Hindusthan	India	28	54. Gangapur	India	16
33. Pradjekan	Java	20	55. Nizam	India	22
34. Grosse Montagne	Guadaloupe	22	56. Dacca	Pakistan	18
35. La Belgica	Bolivia	12	57. Assam	India	16
36. Kesar	India	18	58. Samagra	India	16
37. Cassequel	Angola	18	59. Porvenir	Dom. Rep.	20
38. Moron	Cuba	30	60. Ste. Madeleine	Trinidad	18
39. Plata	Puerto Rico	28	61. Reforma	Cuba	26
40. Cambalache	Puerto Rico	36	62. San Antonio	Nicaragua	20
			63. Valdez	Ecuador	20

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***45 New Units in 1956...**

Is Your Continuing Proof of Superior Performance

In less than 4 years, 63 RapiDorr clarifiers — 45 in 1956 — have been ordered by sugar manufacturers in 23 countries throughout the world for both new installations and for conversion of existing stations. Write for a copy of Bulletin Number 4092.

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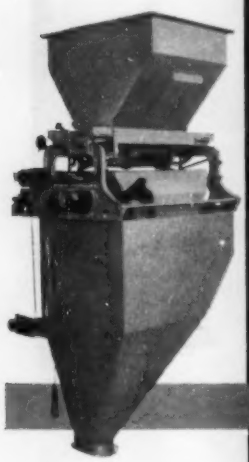
both bagging speed and weighing accuracy with Richardson SUGAR SCALES

It's a simple matter to assure yourself of fast, accurate sugar weighing—add an automatic Richardson Bagging and Weighing Scale to your production line. It makes sense . . . and dollars, too . . . to use scales designed *specifically* for handling your product. The close weighing tolerances you require are achieved without the loss of bagging speed so necessary to profitable operation.

For economically handling sugar—raw or refined—the special features built into a Richardson sugar scale provide you with long-lasting, dependable service. Here are the units for the job.



For handling refined sugar—
The Model FFF Automatic Bagging Scale
ACCURATE TO ONE OUNCE PER 100# BAG
UP TO TEN 100# BAGS PER MINUTE

- exclusive screened dribble-reserve hopper for uniform feed—in spite of occasional lumps
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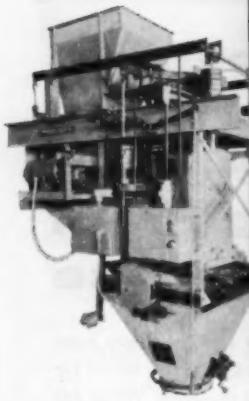
- automatic or manual discharge
- even arm, 1 to 1 balance beam for consistent accuracy
- stainless steel construction



For handling raw sugar—in bulk or to sacks—
The Model J39 Automatic Belt Feed Raw Sugar Scale
ACCURATE TO ¼ TO ½ OF 1%
UP TO THREE 325# WEIGHINGS PER MINUTE AND FASTER ON 100# AND 250# BAGS
(Available in Kilos)

- stainless steel hoppers prevent corrosion
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VOLUME 52, NO. 2
FEBRUARY, 1957

SUGAR y

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COVER: *From field to table production of sugar is being accelerated to meet an extraordinary increase in demand, the more significant because it stems from a rising standard of living in many parts of the world as well as from the normal increase in the world's population.*

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AZUCAR

Including El Mundo Azucarero

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PORTADA: *Desde el cañaveral hasta la mesa, la producción de azúcar se está acelerando para satisfacer un aumento extraordinario en la demanda, lo que es aún más significante porque nace del ascenso en el nivil de vida en muchas partes del mundo así como del aumento normal de población en el mundo.*

NBP BFA

PUERTO RICO:
Arturo Riollano
P. O. Box 553
Isabella
Puerto Rico

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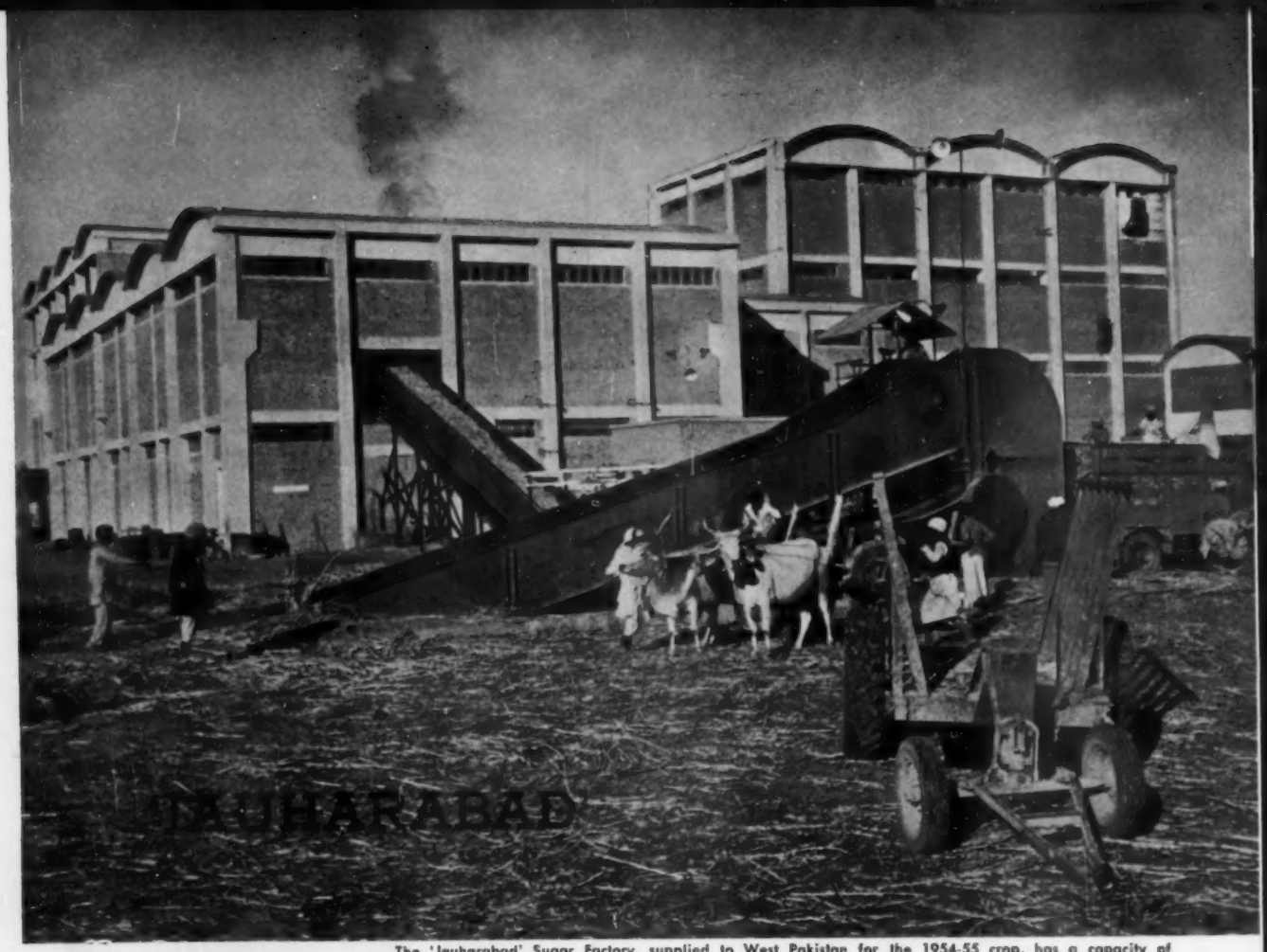

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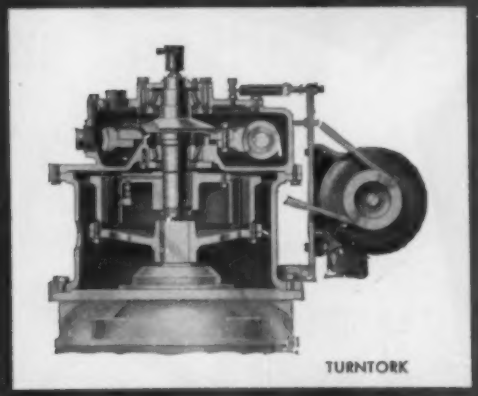

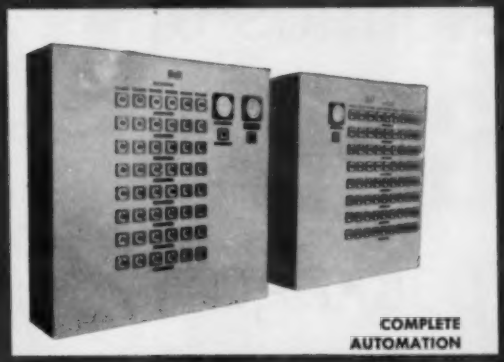

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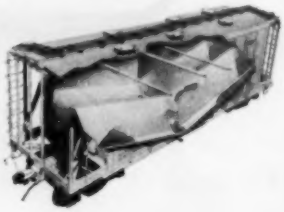

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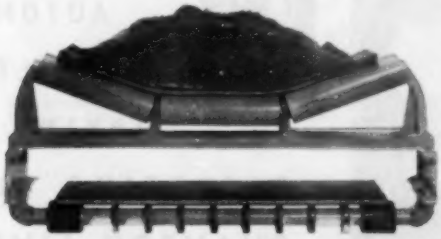
What's more, Link-Belt offers a single source for the design, manufacture and erection of entire handling systems. And that means careful attention to every item . . . down to the last detail.

Get in touch with your Link-Belt representative, or write direct.



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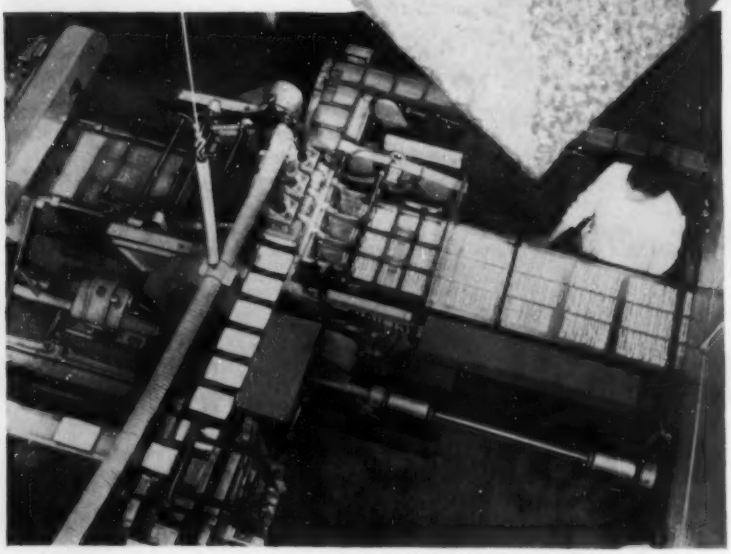

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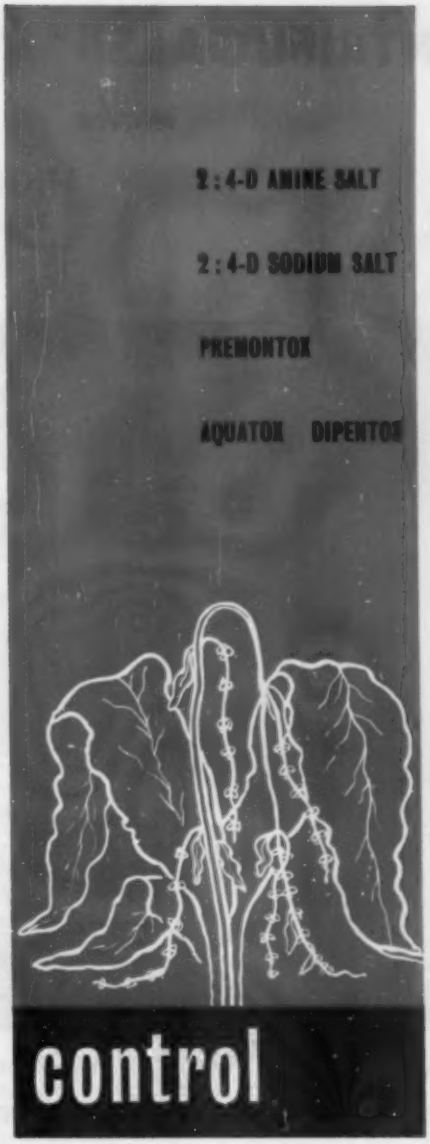

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Our specialities for sugar cane are: milling tandums, vacuum boiling pans, centrifugals and sugar coolers.

Milling station of a cane sugar factory built by the BMA last year in India.

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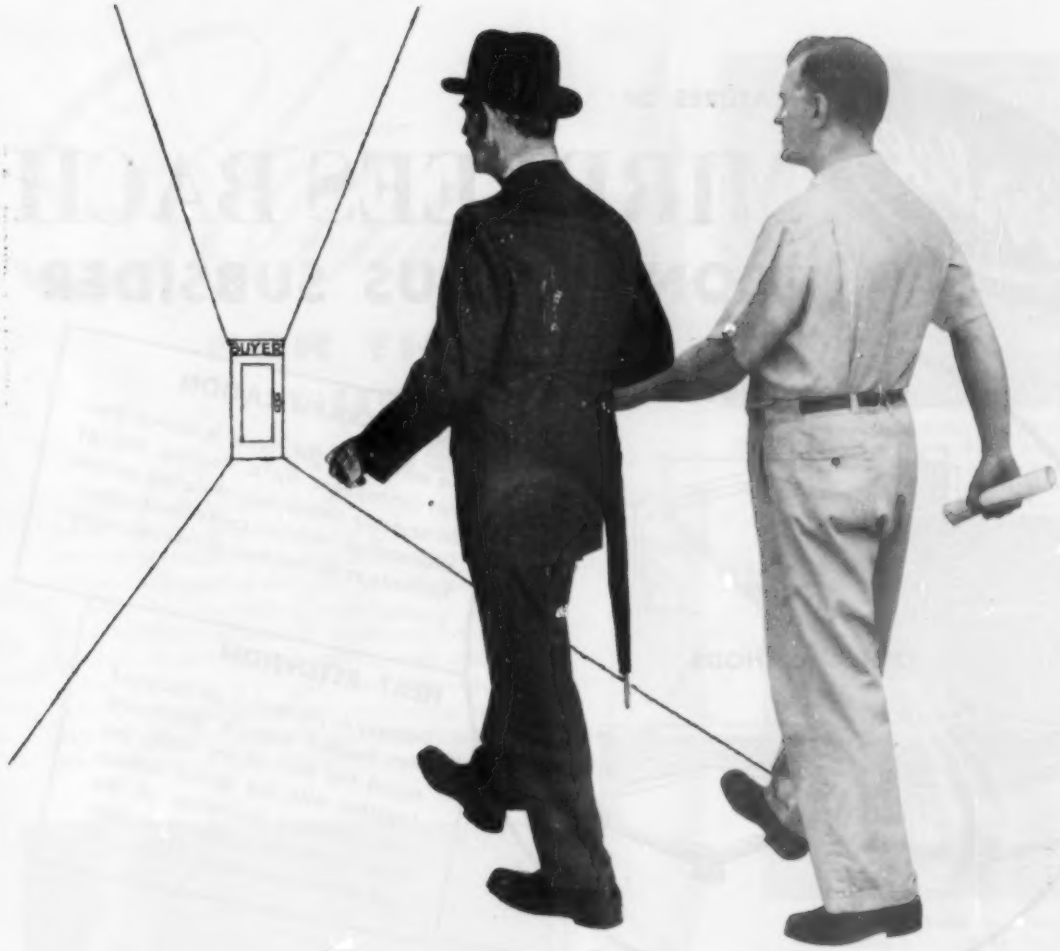

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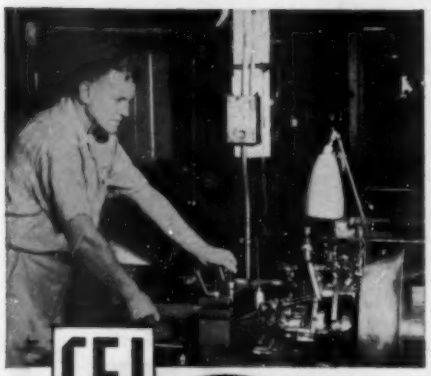

This closer operator—running a machine which forms our rope—is with your Wickwire Rope Distributor every time he makes a call.

True, he's physically in the mill, where he's carefully conducting this final fabricating operation. But, whenever your Wickwire Distributor makes a call, he has the full assurance that every foot of Wickwire Rope has been carefully assembled by skilled craftsmen . . . and that it will give you long, trouble-free service on your job.

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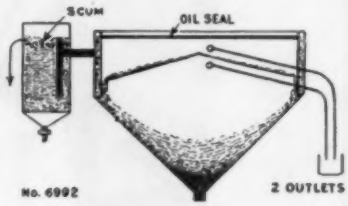
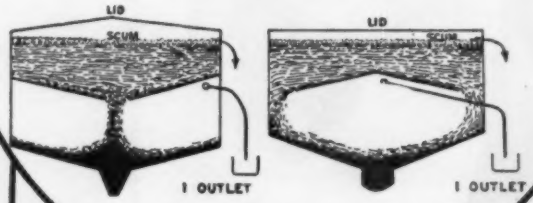


OTHER METHODS



SEALED CLARIFICATION

The surface of the liquor is sealed from the atmosphere by a floating film of oil or other means thus obviating surface evaporation with its consequent uncontrollable radiation and convection movements.

HEAT RETENTION

Delivery to the tank is so designed that heated juice is distributed round the wall of the tank. This together with the sealed surface and external insulation of the tank maintains a high temperature throughout the apparatus.

JUICE DRAW-OFF

A draw-off pipe is placed below each tray at the point to which all clear juice automatically rises and one outlet draws off uniformly and centrally from the point of optimum clarity.

MUD DEPOSIT

The trays in the tank slope upwards to the centre and rotating scrapers sweep the mud gently to and off the outer edges. The large area there reduces velocity so that no mud is carried back by incoming juices. Concentration of mud is effected by sloping the subsider bottom at about 45°.

VENTING

Gas accumulation in mud is dispersed by the introduction of a jet of steam at intervals.

SCUMS

No surface scums enter the Subsider as these are automatically drained off in liquor level regulating tank. No flocculating chamber is required, so volume of juice in tank is relatively small and sucrose losses are minimized.

SEALED Mirrlees' "Bach" CLARIFICATION

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SCOTLAND STREET GLASGOW C.5

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FOR THE SUGAR INDUSTRY

Combustion Engineering offers sugar mills a complete line of steam generating units equipped with stokers especially designed to burn bagasse better than can be done by any other method.

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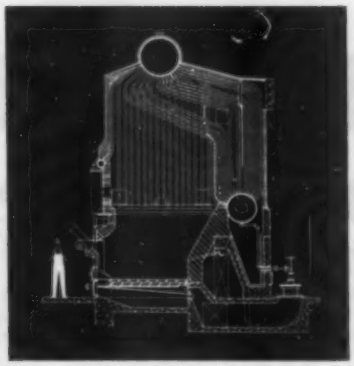
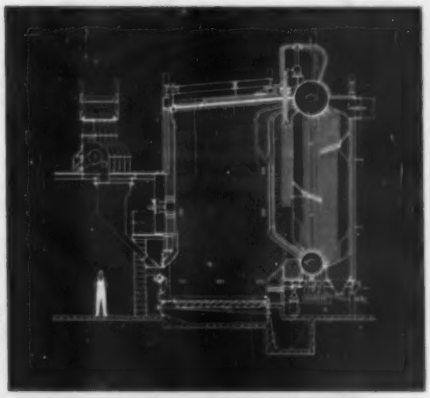
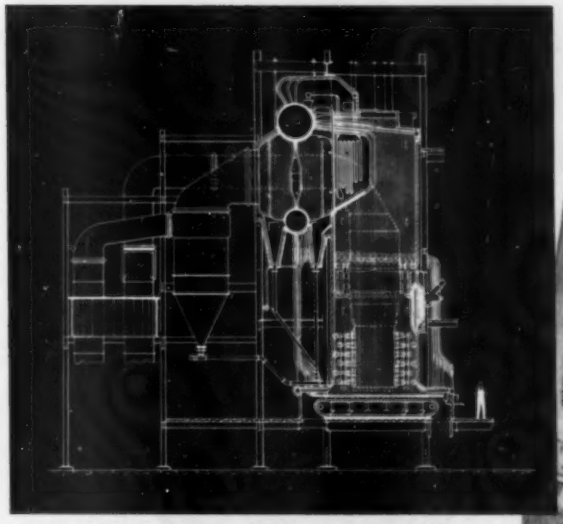


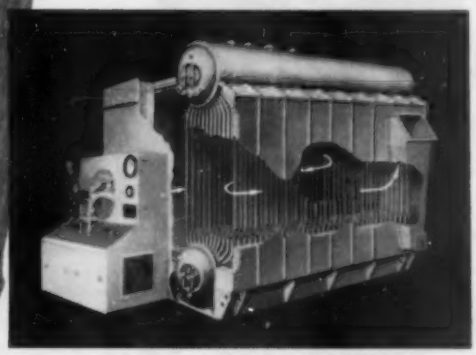
C-E Vertical-Unit Boiler, Type VU-10, equipped with C-E Bagasse Burning Stoker (Dump Grate Type). Units of this design are suitable for steam capacities up to about 45,000 pounds of steam per hour.



C-E Vertical Unit Boiler, Type VU-50, equipped with C-E Bagasse Burning Stoker (Dump Grate Type). This design is suitable for steam capacity requirements up to about 125,000 pounds of steam per hour.



C-E Vertical-Unit Boiler, Type VU-40, equipped with C-E High-Set Bagasse Stokers with continuous discharge traveling grate; tangential, auxiliary oil burners and tangential air admission are also employed. Especially suitable for steam requirements above 125,000 pounds of steam per hour.



C-E Package Boiler, Type VP. This oil or gas fired unit is especially suited for off-season and auxiliary steam needs. It is a complete, compact, shop-assembled boiler—simple and economical to install, operate and maintain.

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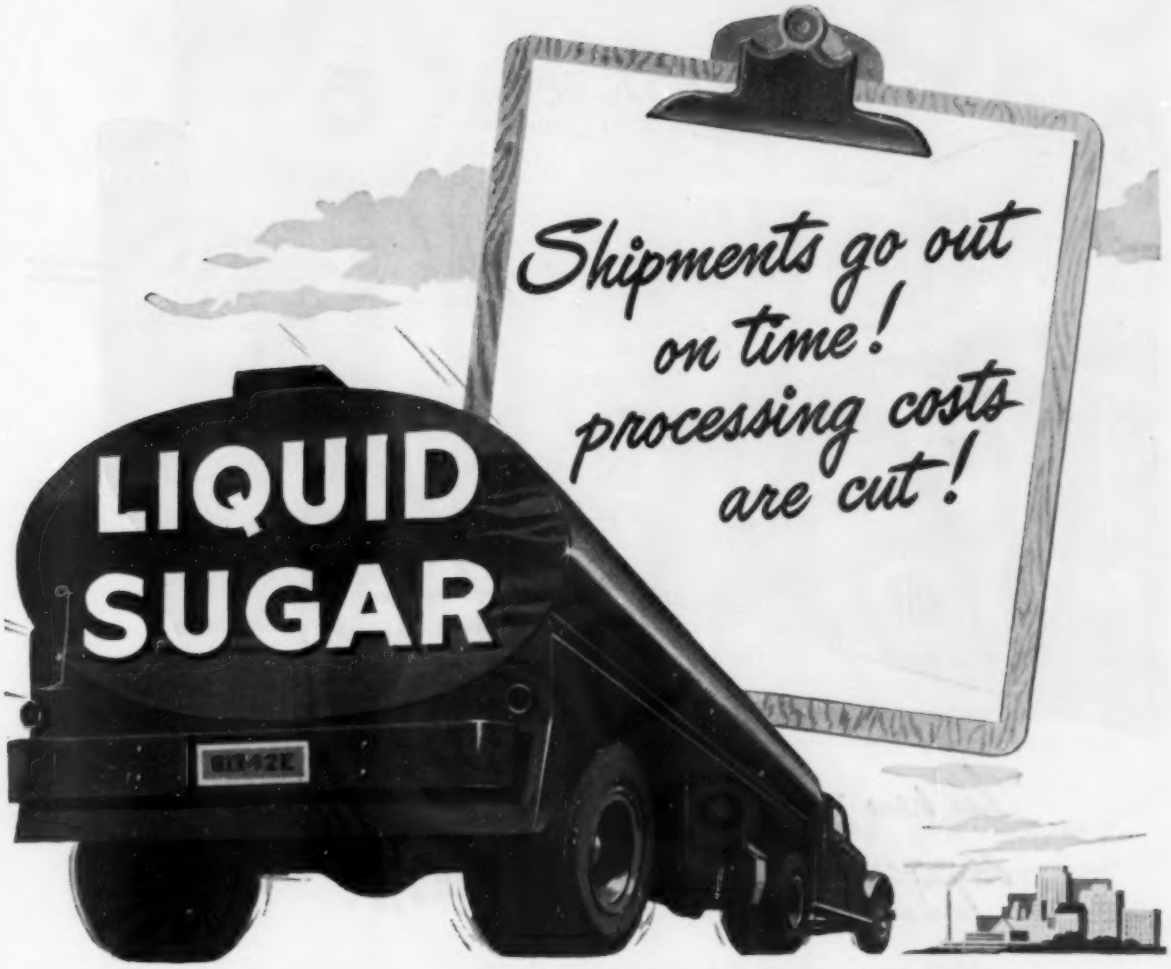

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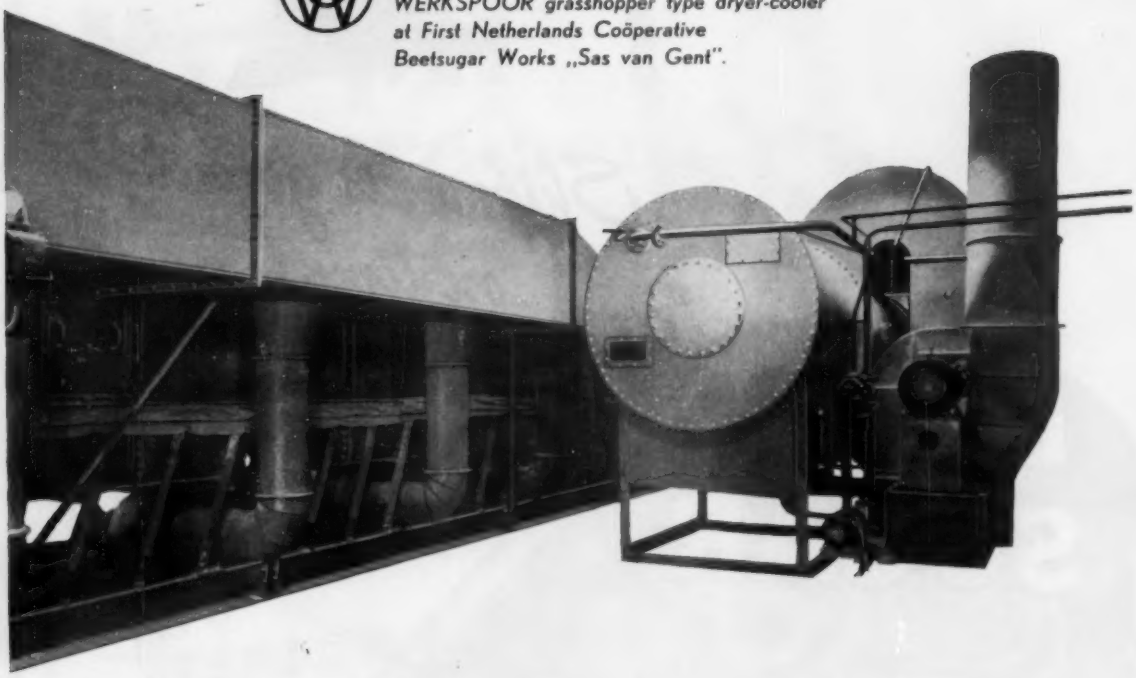

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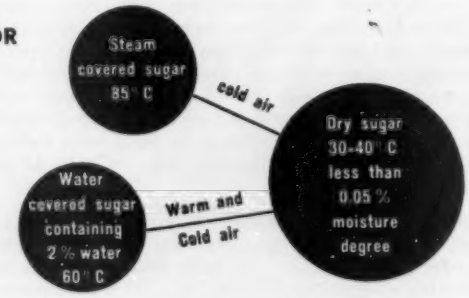

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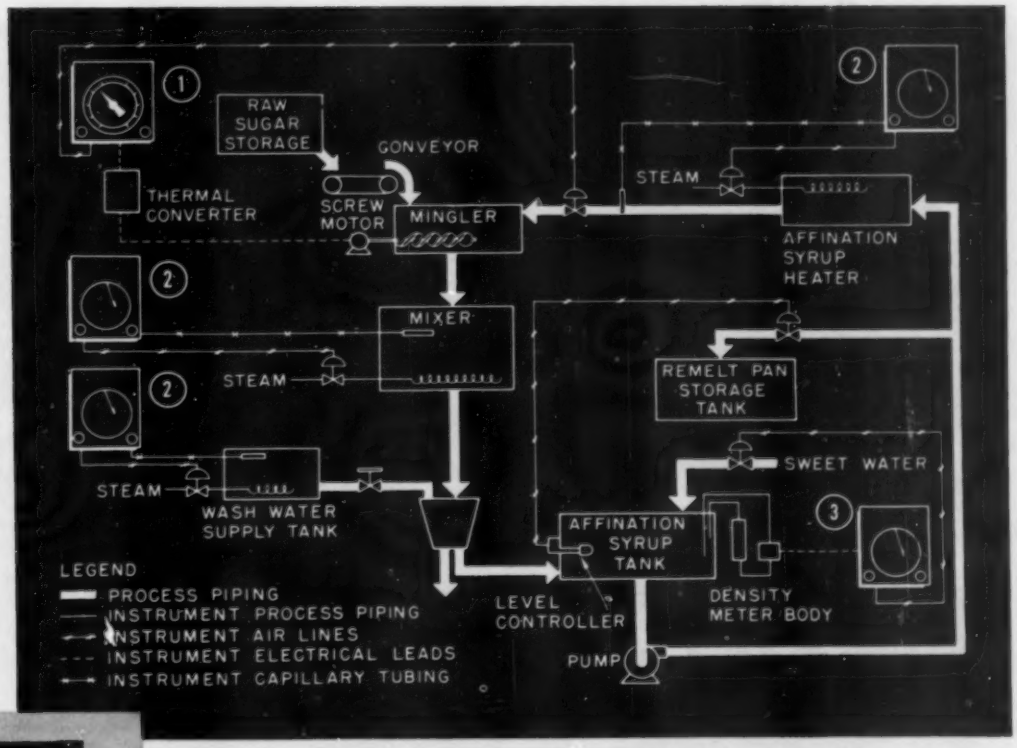
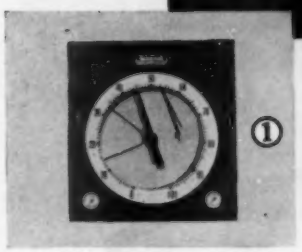
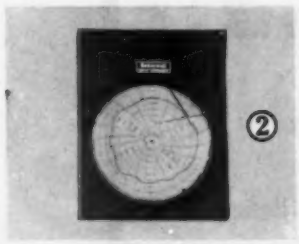


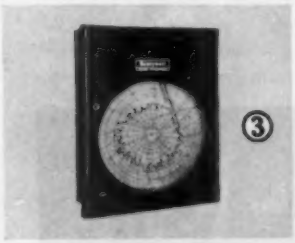
Honeywell instrumentation controls a two-stage mingling process at an affination station.



Motor Load Recorder—Records load on screw motor delivering raw sugar to mingler and proportions admission of affination syrup.



Thermometer Controllers—Record and control temperature in mixer, wash water supply tank, and affination syrup heater.



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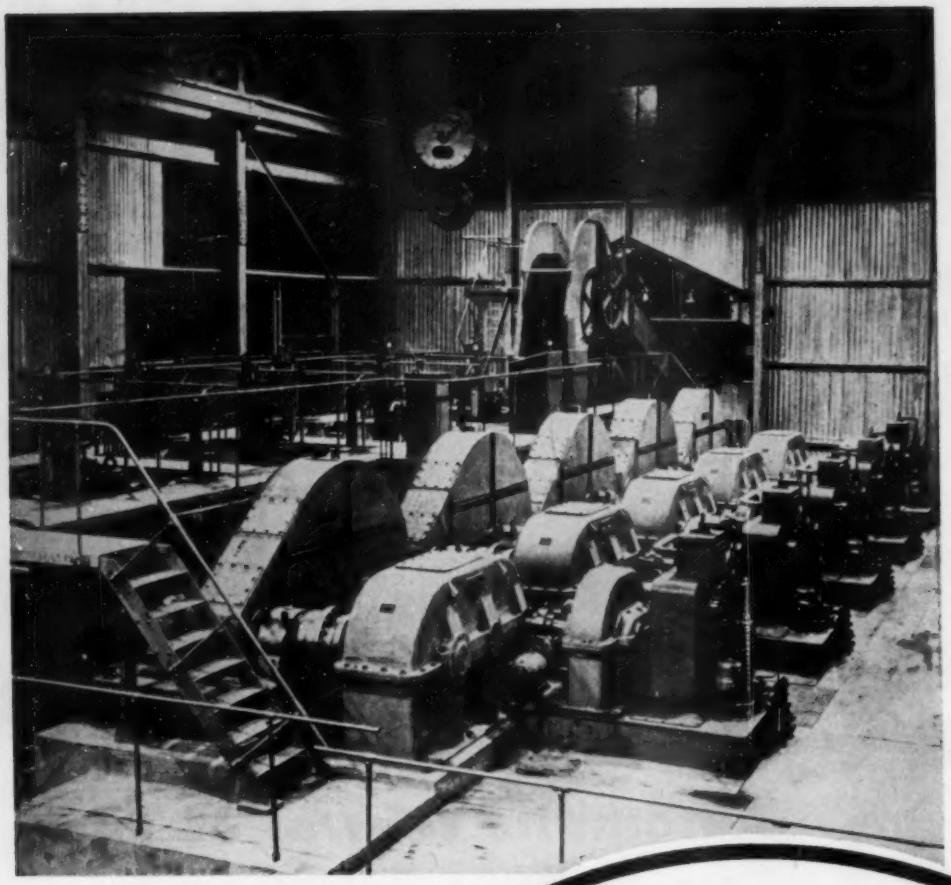

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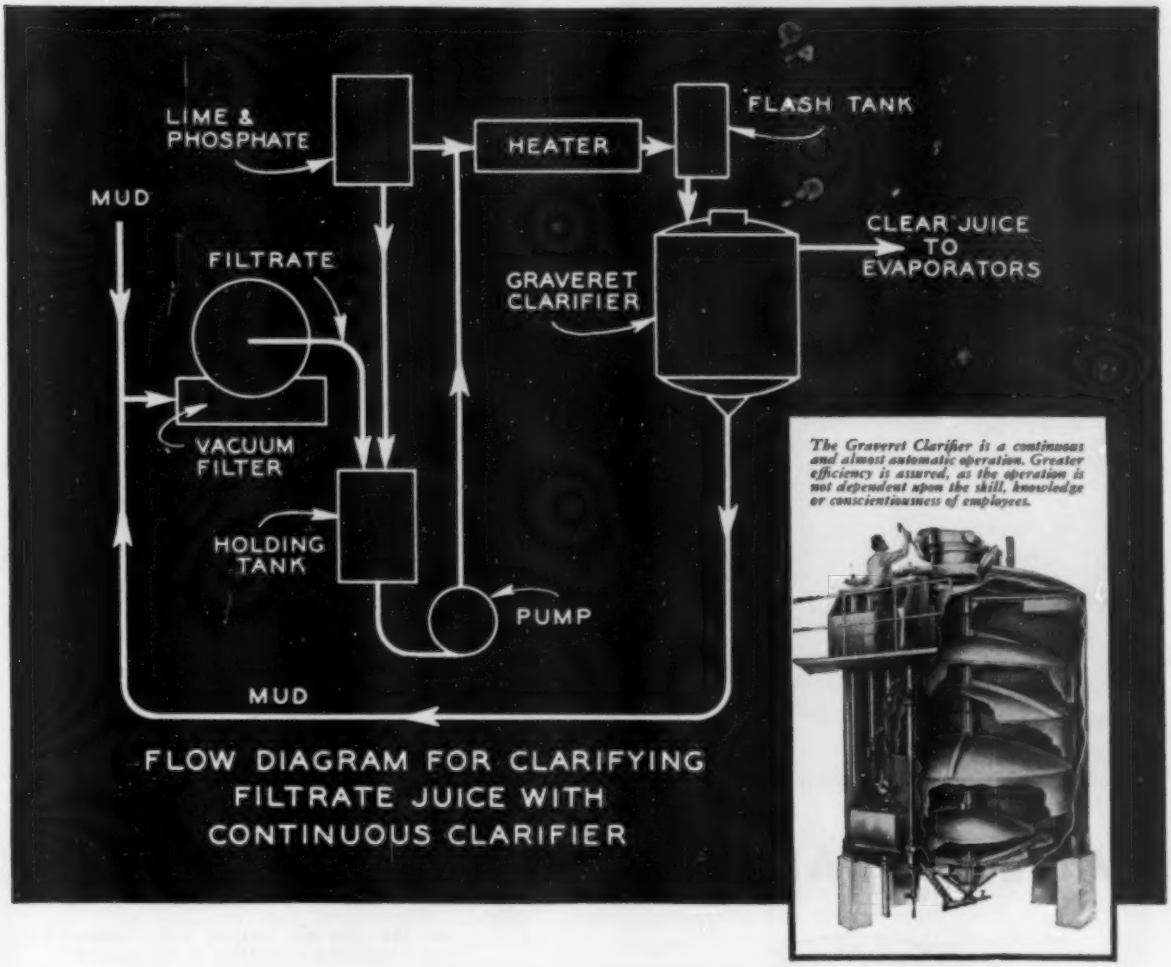

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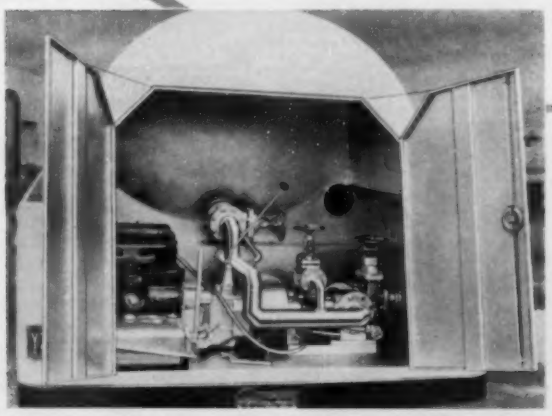

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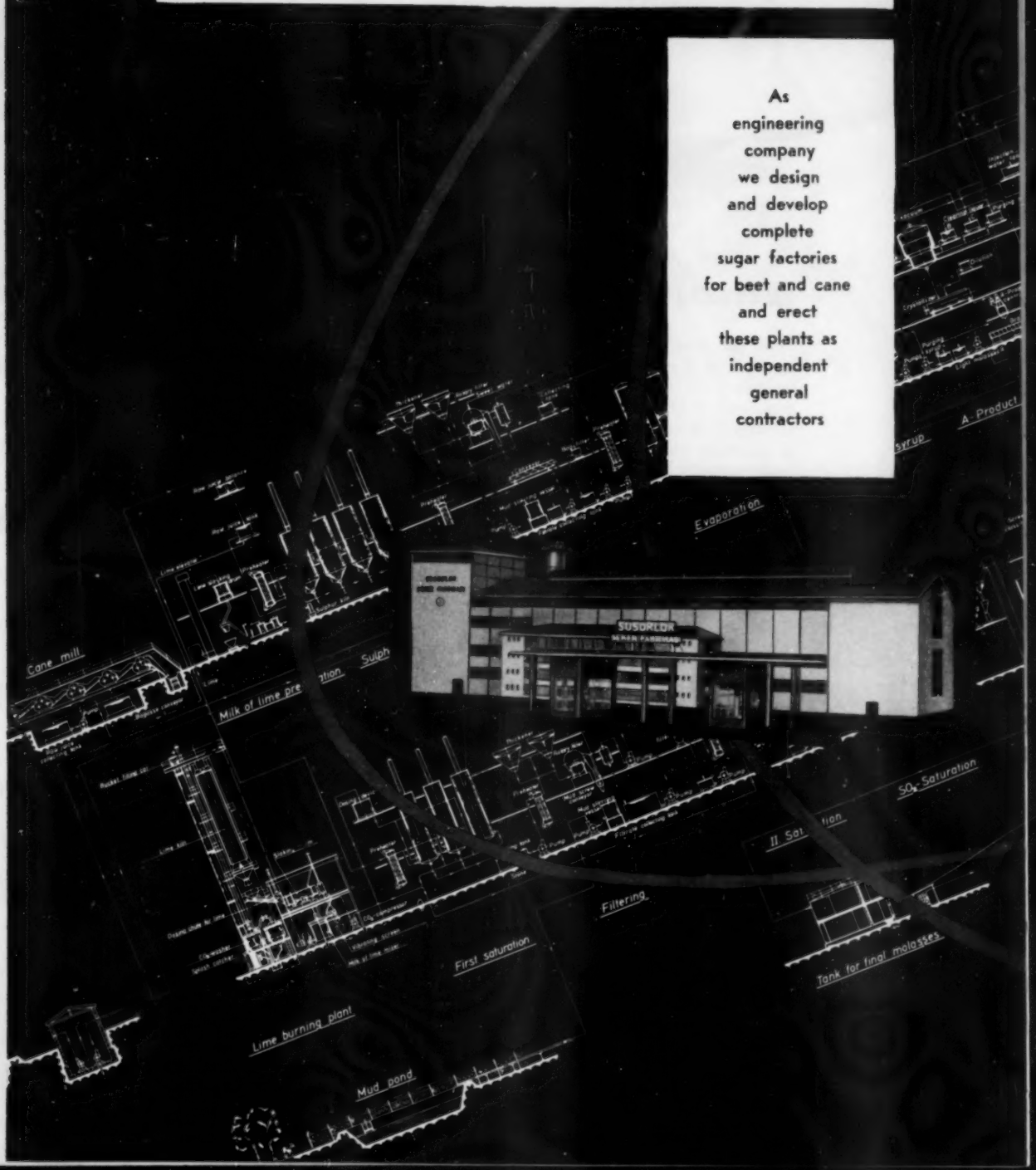

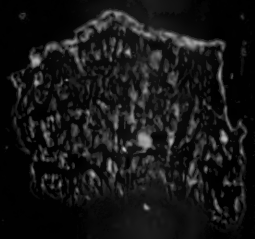

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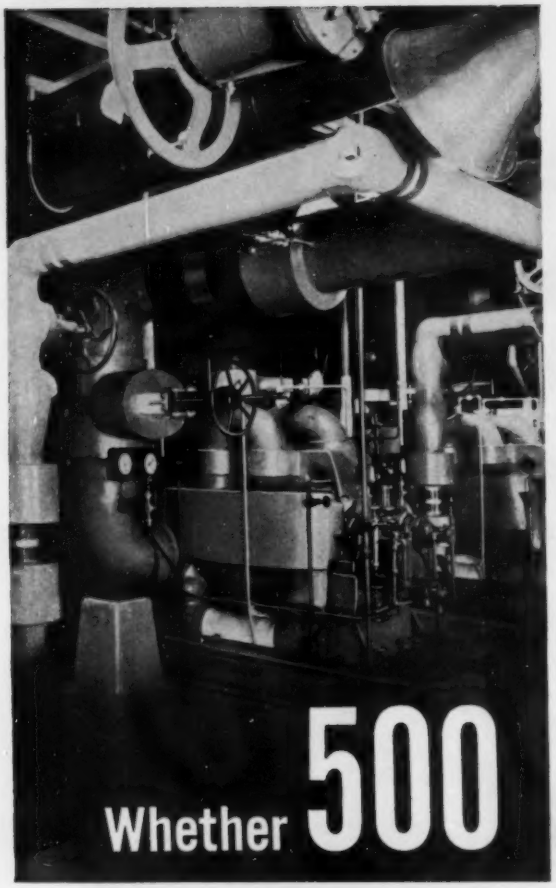

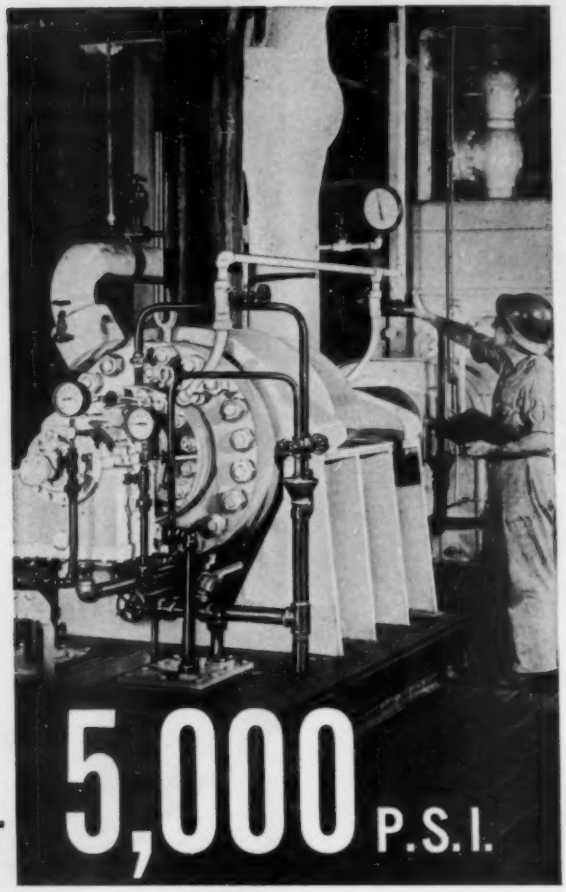

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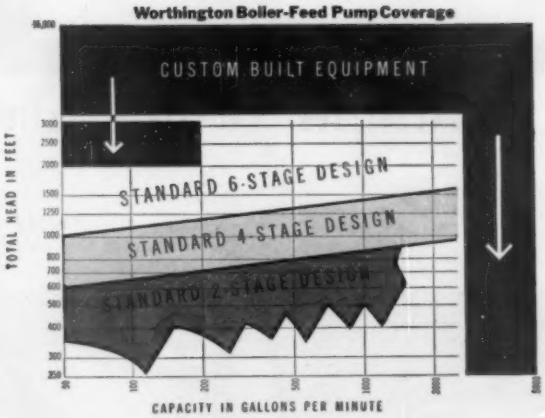

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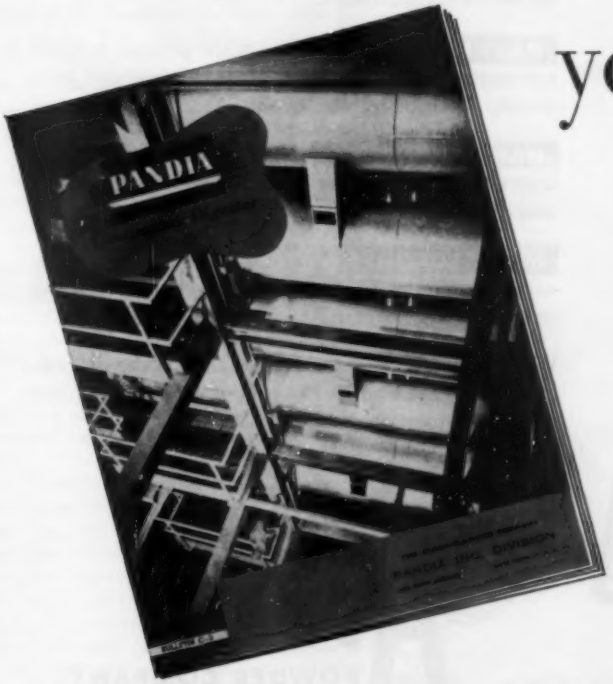

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EUROPE 1956-57

Adverse Growing Conditions Cut Crop

By Dr. Hugo Ahlfeld

After publication of the second estimate of European sugar production by F. O. Licht and of the results of the November inquiry of the International Association for Sugar Statistics the statistical information for Europe is now so reliable that it is possible to get a realistic picture of the prospective sugar position of the various European countries in the campaign year 1956/57.

In summer 1956 the growth of sugar beets was not favored by the weather. First, there was an excess of moisture during the decisive months of growth. Moreover, the weather during the campaign was adverse. Heavy rainfall hampered harvest and transportation so that the sugar factories were not continuously supplied with adequate amounts of raw material. Also the sugar content of beets suffered from the wet weather. Finally, some countries met with difficulties in procuring sufficient labor. All in all, the development has been unsatisfactory during both the period of growth and the campaign.

The adverse conditions are fully reflected in the crop results. Although the western European sugar beet area was increased from about 1,635,000 hectares last year to 1,668,000 hectares this year, sugar output is expected to reach only 6,820,000 metric tons, raw value, compared with 7,189,000 tons last year. In eastern Europe conditions were similar. In most countries the 1956/57 sugar production will not reach the previous year's results. If despite this, total eastern European output is estimated at 7,038,000 tons, which is slightly more than last year when it amounted to about 6,903,000 tons, the increase is almost exclusively due to the enormously increased beet area in the Soviet Union.

For **Western Germany** F. O. Licht anticipates a sugar production of only 1.19 million metric tons, raw value, or 1.071 million tons, white value. With an increase of only 4% in demand, sugar consumption in 1956/57 would reach 1.52 million tons. At the beginning of the current campaign only the normal carryover was available, hence it will be necessary to import the difference of about 449,000 metric tons, raw value. In this context the question arises whether it is not better for Western Germany to keep larger reserves than in past campaign years. The political crisis late in the year has shown that situations may occur which endanger adequate supplies, even without a world-wide conflict.

The **Austrian** sugar crop is estimated at 207,000 metric tons, raw value, compared with 214,000 tons last year. As consumption in Austria is anticipated to reach 245,000 tons, the country will have to import certain amounts of sugar in 1956/57 too.

In **France** the growth of beets as well as harvesting and slicing operations were considerably hampered by adverse weather conditions. Moreover, the lack of labor rendered harvesting difficult. As a result sugar production will decline from 1,631,000 tons last year to 1,400,000 metric tons, raw value, this year. The reports available from other producing territories of the French Union show that the reduction in Metropolitan France will not be compensated by a similar increase in overseas territories so that the French Union will be among the net importing areas in 1956/57.

Despite an increase in area of almost 3,000 hectares, sugar production in **Belgium** during the current campaign will reach only about 319,000 metric tons, raw value, versus 387,000 tons last year. As consumption can be estimated at about 305,000 tons an amount of 14,000 tons would be available for export from production.

Owing to adverse weather, the **Dutch** 1956/57 sugar output shows a reduction from about 425,000 last year to 365,000 metric tons, raw value. Also in that country the beet area had been increased, but the bad weather did not allow the sugar industry to achieve a higher output. Thus the Netherlands will have to import about 70,000 tons of sugar to cover domestic requirements. Of course, imports of raws for export after refining are outside these calculations.

Denmark belongs to the few countries

EUROPEAN SUGAR PRODUCTION

(metric tons, raw value)
(According by F. O. Licht,)

Countries	*1956/57*	*1955/56*	*1954/55*
West Germany	1,190,000[a]	1,297,162	1,316,451
Austria	207,000	214,080	223,309
France	1,400,000	1,631,339	1,687,307
Belgium	318,900	387,231	346,752
Holland	365,000	426,809	421,920
Denmark	330,000	275,094	220,600
Sweden	290,000	240,540	294,227
Italy	950,000	1,130,000	892,000
Spain	379,236	322,312	265,148
Yugoslavia	158,000	129,914	145,940
Switzerland	28,000	33,300	33,285
Great Britain	720,000	703,269	653,590
Ireland	100,000	92,574	100,363
Finland	28,000	22,489	37,158
Turkey	356,000	283,000	198,609
West Europe	6,820,136	7,189,113	6,836,659
East Germany	670,000	712,810	814,664
Czechoslovakia	625,000	729,770	772,393
Hungary	225,000	293,641	270,971
Poland	1,000,000	1,089,434	1,151,110
Roumania	250,000	208,000	165,000
Bulgaria	68,000	70,000	87,110
Soviet Union	4,200,000	3,799,000	2,901,000
East Europe	7,038,000	6,902,655	6,162,248
Europe total	13,858,136	14,091,768	12,998,907

a) Including 20,000 tons, raw value, from imported foreign beet which could not be considered in our first estimate.

which will have a higher sugar output this year, compared with last year, *i. e.* 330,000 metric tons, raw value, against 275,000 tons. As a result, Denmark will have more sugar available for export than last year.

In **Sweden** total sugar beet area was reduced from 54,000 hectares in 1955 to 51,800 hectares this year. Despite this reduction, sugar production during the current season is anticipated to reach 290,000 metric tons, raw value, compared with about 240,000 tons last year. This fact emphasizes anew the importance of weather for the output of sugar. Still, the 290,000 tons available from the current crop will not be sufficient to cover total Swedish requirements which may be estimated at 335,000 tons.

The high sugar production of **Italy** during the campaign year 1955/56 (1.13 million metric tons, raw value) caused a reduction of the sugar beet area from 265,000 hectares last year to 250,000 hectares this year. Originally the reduction was to be larger to diminish the considerable surplus stocks accumulated since 1955. As a consequence of both the reduction in the area and the unfavorable climatic conditions, the 1956/57 sugar output is estimated at 950,000 metric tons, raw value. This amount will be more than sufficient to cover the domestic requirements of about 910,000 tons. At the end of the campaign year 1956/57 high surplus stocks will still be available so competent authorities will certainly make every effort to limit sugar beet cultivation again next year.

In **Spain** the 1956 sugar beet area was increased to 136,525 hectares compared with 114,300 hectares last year. The weather was comparatively favorable so that 1956/57 beet sugar production has reached 379,236 metric tons, raw value, against 322,312 tons last year. As Spanish consumption will reach about 380,000 tons this year's output of beet and cane sugar (the latter will be about 30,000 tons) together with the surplus stocks will allow the country to cover domestic requirements and make certain amounts available for exports.

Yugoslavia has increased her sugar beet area by about 4,000 hectares this year. The 1956/57 sugar output is estimated at 158,000 metric tons, raw value, compared with 130,000 tons last year. As consumption during the current campaign year will be about 195,000 tons, the country will again be compelled to import large amounts of sugar.

In **Switzerland** the sugar position during the current campaign year will not be very different from that of previous years, so that Swiss imports will be at about the same level. Of late the construction of a second sugar factory has been discussed. However, this plan has popped up so often in the past ten years that a certain reserve appears to be advisable.

In **Great Britain** production of 720,000 metric tons, raw value, is slightly higher than last year when it reached 703,269 tons. In view of the large sugar consumption, this small increase is not of great significance so that the domestic beet sugar industry will not change the supply position.

In **Ireland** sugar production has been increased by about 10% against the previous year. The 100,000 metric tons, raw value, available during the current campaign year will not suffice to cover Irish sugar consumption which will reach about 140,000 tons.

The **Finnish** sugar industry had a very bad crop in 1955. In 1956 the sugar beet area decreased from about 17,000 to 14,500 hectares. Despite this reduction a sugar output of 28,000 metric tons, raw value, is expected this year, compared with 22,489 tons last year. As Finnish consumption will be about 165,000 tons, a quantity of about 140,000 tons will have to be imported during 1956/57. Certainly the Soviet Union will be among the most important suppliers.

In **Turkey** the beet area was raised from 97,449 in 1955 to 112,476 hectares this year. Originally, the plan for this year provided for a much higher area, which was not reached due to unfavorable climatic conditions. Despite this, the Turkish sugar industry expects a production of 356,000 metric tons, raw value, compared with 283,000 tons last year. Since consumption will reach only about 250,000 tons, large amounts of sugar should be available for export. In fact, it has been reported that the first transaction has been concluded and that first cargo has left the country.

For the **Soviet Zone of Germany** F. O. Licht has received official crop data which makes it possible for the first time to get a reliable picture of the development of the sugar industry in that part of Germany. As regards the current year the report states that climatic conditions, as in Lower Saxony, have been adverse so that a poor sugar beet crop is expected. Harvesting and transportation of beets is being hampered by a serious lack of labor. In view of this situation an output of only 670,000 metric tons, raw value, is expected, against 712,810 tons last year. Sugar consumption will be about 450,000 tons so that, despite the bad crop, larger amounts will be exported, certainly mainly to the Soviet Union.

In **Czechoslovakia** the appearance of pests was reported throughout the summer of 1956, and considerable damage is said to have been done to the beets. During the campaign, press and radio reports complained repeatedly of delays in harvesting operations and of the danger of losses, so that the 1956/57 sugar production is likely to be substantially below the previous year's. F. O. Licht expects an output of 625,000 metric tons, raw value, versus about 730,000 tons last year. As Czechoslovakian consumption will be in a range of 470,000 tons, only 155,000 tons will be available for export, most of which will certainly also go to the Soviet Union.

In **Hungary** the position is particularly difficult to judge, owing to political events. It may be assumed that the fighting which took place during the campaign, and the prolonged general strike have affected harvesting and slicing operations. Of course, any detailed official reports are not available. F. O. Licht has tentatively reckoned an output of 225,000 metric tons, raw value, compared with 293,641 tons the previous year. Such a crop would not even be sufficient to cover domestic requirements which might be about 250,000 tons.

In **Poland** conditions are similar to those in Czechoslovakia with considerable damage by pests. It is supposed that the present reorganization of Polish agriculture and political unrest has affected the sugar beet campaign. All these facts will certainly entail a reduction in sugar production against the previous year when it reached 1,089,000 tons. F. O. Licht tentatively estimates this year's output at 1,000,000 metric tons, raw value.

In **Roumania** the sugar beet area has been considerably increased over the previous year. Correspondingly the 1956/57 sugar output is expected to reach 250,000 metric tons, raw value, compared with 208,000 tons last year.

As regards **Bulgaria** it has turned out in the course of this summer that sugar beet cultivation has reached a larger extent than had been assumed so far. The 1956/57 area is estimated at 50,000 hectares compared with 47,700 hectares last year. In view of weather conditions during the growing period it may be expected that this year's output will reach 68,000 metric tons, raw value, compared with 70,000 in 1955/56. This amount will be sufficient to cover domestic requirements.

In the **Soviet Union** an enormous increase in sugar beet area has doubtless taken place this year. Official statements are not yet available, but the 1955/56 area is officially reported at 1.76 million hectares and for 1954/55 at 1.6 million hectares. The weather has been normal for both the growth of beets and the campaign. F. O. Licht expects for 1956/57 an output of 4.2 million metric tons, raw value. This compares with the official production figures of 3,419,000 and 2,611,000 metric tons, white value, for 1955/56 and 1954/55, respectively, which would be 3,799,000 or 2,901,000 metric tons, raw value. A production of 4.2 million metric tons would enable the Soviet Union to cover domestic requirements to a larger extent than last year. In addition, she will certainly continue to import larger amounts of sugar from Eastern Germany, Poland, Czechoslovakia, and, on the other hand, fulfil her export obligations in her traditional markets such as Finland and Iran.

Total European sugar production during 1956/57 is estimated at about 13,858,000 metric tons, raw value, compared with 14,092,000 tons last year. Despite all differences in the various countries, this year's production will thus not be very far from the previous year's.

World's Largest Bagasse Mill

$14 Million Pulp and Paper Mill For Central Trinidad

"THE significance of the new Papelera Pulpa Cuba project lies in the fact that it will stimulate other sugar producing areas to exploit bagasse as a raw material for pulp and paper, and thus help to supply projected fiber needs," said Dr. Joseph E. Atchison, vice president of Parsons & Whittemore, Inc., speaking in New York late in December 1956.

The project referred to: a $14 million completely integrated bleached bagasse pulp and paper mill to be located at the port of Trinidad on the southern coast of Cuba.

The occasion: conclusion of contracts in New York between Papelera Pulpa and Parsons & Whittemore under which P & W will supply the equipment for the new plant.

The new bagasse pulp mill will be the largest and most modern facility of its kind in the world when it is completed 16 months hence. Capacity will be 100 tons per day of bleached and unbleached pulp and paper. Located adjacent to Central Trinidad, a 3,000 ton per day raw sugar mill operated by the same interests that control Papelera Pulpa Cuba, S.A., this will be the first installation in the world in which all component parts, including the paper machine itself, will be designed specifically for handling bagasse.

The location of the pulp and paper mill is ideally suited to meet its requirements for bagasse since facilities at the mill site include an excellent transportation system for bringing in an ample supply of bagasse from all the surrounding mills in addition to the full outturn of bagasse from Trinidad which will convert to oil fuel. It is the conviction of Mr. Jesus Azqueta, president of the new company, that a successful bagasse-pulp mill cannot depend on surplus bagasse from raw sugar houses, but must have the entire output of a mill that has converted to gas or oil fuel. This can then be supplemented by the purchase of surplus bagasse as demand warrants; but the basic supply is assured from a single mill.

Production will include bleached paper and board of many types, as well as a variety of unbleached papers, corrugating board and container board for corrugated boxes. The plant's output, combined with that of the existing Cuban mills is expected to satisfy completely the Cuban market in all grades of paper and paper board, except newsprint and certain paper of very special quality. Newsprint to supply the Cuban newspapers will be manufactured by a new mill now being constructed in Cardenas, Cuba, using the Joaquin de la Roza process.

The project is expected to be the forerunner in the development of a sizable pulp industry in Cuba based on bagasse, whose only other use there now is as fuel in the sugar mill boilers. The resulting high quality pulp would then be sold in world markets as a special blending pulp, taking advantage of its special characteristics in a great variety of grades of paper.

Papelera Pulpa Cuba, S.A., which is undertaking the new project, is itself a new company, whose principal owners are leading industrialists in Cuba.

Jesus Azqueta, president of the new venture, operates three sugar mills in Cuba and a large sugar mill in Venezuela. The raw material supplies for the new mill are, therefore, assured. Rafael Palacios, treasurer of the new company has been highly successful in a number of industrial enterprises in the rapidly developing Cuban economy while G. Castro, vice president, has interests in two sugar mills and one of the existing paper mills in Cuba.

Principal officers of Papelera Pulpa Cuba, S.A. are uniquely qualified for this enterprise having had extensive experience in both the paper and the sugar industries as well as a profound knowledge of corporation finance and operation. Engineers of Papelera worked jointly with those of Parsons & Whittemore on the design of the pulp mill which is nearing the final stage. One member of Papelera's executive staff is Mr. Y. T. Kao, a leading world expert on pulping bagasse. Mr. Kao was formerly mill manager of Hsinying pulp mill on Formosa for more than a decade. This mill used bagasse on a large scale having a capacity of 80 tons per day of bleached pulp. Obviously, Mr. Kao will play a key role in the design and operation of the Trinidad paper mill.

Dr. Joseph E. Atchison, vice president of Parsons & Whittemore, builders of the new 100-ton per day bagasse pulp and paper plant. With an extensive background of experience in this field, Dr. Atchison handled the principal negotiations for Parsons & Whittemore and helped work out major engineering problems.

Orders for the needed equipment can now be placed and, in fact, the paper machine has been ordered from Black-Clawson Company, an affiliate of Parsons & Whittemore. Parsons & Whittemore is operating on a world-wide basis in the development of pulp and paper mills utilizing annual crops available locally. Their experience extends to Europe, Mexico, North Africa, Portugal and South America. Currently they are working on a bagasse pulp and paper mill in Colombia. Dr. Atchinson, who represented Parsons

(*Continued on page* 49)

Senior partners in the new Papelera Pulpa Cuba, S.A. sign final financial papers with the president of the National Bank of Cuba; Dr. Joaquin Martinez Saenz of the Cuban Bank (center) passes a check to Mr. Jesus Azqueta, well known Cuban industrialist and president of Papelera (right), while treasurer of Papelera Pulpa, Mr. Rafael Palacios (left) looks on. Mill is expected to be in operation by mid-1958, will complete Cuba's self-sufficiency in paper products.

Harvesting sugar cane on an 84-acre farm in Australia. Mountains in background are on Hinchenbrock Island just off the Queensland coast.

Report on the Australian Industry

Advanced in Mechanizations and Transport

AUSTRALIA is the fourth largest sugar producing area in the world. Only Cuba, India and Brazil have greater annual outturns. The Australian crop averages over 1,300,000 short tons. This is produced on about 9,000 cane farms in the sugar districts extending some 1,300 miles along the northeastern coast of the country, facing the Pacific Ocean. Cane areas, on the average, extend only a depth of 10 to 15 miles from the coast.

The State of Queensland produces 97 percent of all sugar. Most of the some 400,000 acres harvested each year are in this area. At least 80,000 people are directly or indirectly employed in the industry. Australians not only work in sugar; they also eat it. Annual consumption averages about 120 pounds per person.

The cane areas are widely scattered in this huge country which is the size of the U. S. Sugar men say present production could be boosted 25 to 50 percent without appreciable increases in capital investment. Land is almost unlimited for further expansion, especially if water could be made available.

Only 12 to 15 percent of the growing land is presently irrigated and much of the cane is produced with an average rainfall of only 45 to 50 inches. In the far north, some areas have over 100 inches of rainfall per year.

About half of the sugar output in Australia is consumed locally, the remainder is exported. Most of this goes to areas operating under the British Commonwealth sugar agreement.

There are 34 raw sugar mills. All but three are located in Queensland. Fifteen mills are cooperatives run by cane growers.

No beets are grown for sugar production in Australia, even though the weather is ideal for them in the southern part of the country. As early as 1896, efforts were made to foster the industry. The last factory in Victoria, subsidized by the government, closed in 1948.

Most of the cane is grown by independent farmers. Fairymead Sugar Company at Bundaberg has the largest plantation (mill growing its own cane). They produce some 150,000 tons of cane.

Cultivation operations in the Australian sugar industry are generally well mechanized. However, as the farms average only some 50 to 60 acres each, the equipment used is mostly small. The exception is in land clearing where heavy duty bulldozers are required.

Seed planting is also becoming mechanized on most farms. The Australians have developed an ingenious little rig that digs a furrow, plants seed pieces which are first fed by hand into a tube, and applies fertilizer. These units are usually pulled by a small tractor and handled by two men.

Mechanical loading is the next development receiving consideration. Loading of cane is a dirty, heavy job that will get attention long before mechanical harvesting. A number of light portable cane grab units are in operation.

Mechanical harvesting is being experimented with by only a few. Fairymead Sugar Company has done outstanding work in this area, and they mechanically cut virtually all of their plantation crop with harvesters. The company does most of its own design work on the machines. It even has a unit that will handle "down" cane, in addition to the conventional upright cane.

The use of truck transportation has not progressed far, except for hauls to mill tramlines or government railway lines in the central and southern districts of Queensland. Mill companies own some 2,000 miles of light rail, or tram, lines. They use 200 locomotives and 33,000 cane cars. In addition, large quantities of cane are moved on the government-owned railway.

It is likely that no more progress has been made in the conversion from rail to truck hauling because permits must be secured to move cargo on the highways. The government railroad has blocked most efforts that would divert business from its lines.

There are isolated cases in which truck hauling from field to mill is progressing. Maryborough Sugar Company, for example, transports about 50 percent of its cane by truck. This is probably the highest percentage in the industry. On the average, not more than 5 percent of the total crop moves by truck from field directly to the mill. Some 25 percent of the crop moves from fields to a transfer point on the mill tram lines, or government rail lines.

Almost half of the Australian crop is grown in regions that have frost 5 to 50 days each year. It is said that temperatures of 31 to 32 degrees have no effect on the cane except to check growth. Not until temperature gets 26 or 27 degrees for several hours will the plants be killed. Even then, if there is juice in the cane, it can be harvested without too much loss.

All of the cane is burned before harvesting. Most of the crop is of the one variety. However, some 24 months cane is grown in isolated areas. In 1954, the average industry yield was slightly over 26 tons of cane per acre.

The Australian method of handling the distribution and sale of sugar is interesting. All raws are acquired by the state government on behalf of the Commonwealth (Federal) government. The Queensland state government appoints a Raw Sugar Board which, in turn, appoints agents to handle the refinining and distribution of the sugar crop.

Agents for many years have been The Coloniai Sugar Refining Company, Ltd. and Milliquin Sugar Refining Company. The latter company are agents only for the refining of some 25,000 tons at their raw factory, and its distribution in the Bundaberg area. C. S. R. does the refining and distribution of all other sugar in Australia, and markets the surplus overseas. C. S. R. has refineries at Brisbane, Sydney, Melbourne, Adelaide and Perth with a capacity of some 550,000 long tons.

Victoria Sugar Factory in Queensland, Australia, showing the water cooling system outside the factory.

A double-row Sugar Cane harvester, mounted on a 30 h.p. tractor, used by the Fairymead Sugar Company, Ltd.

The Australian industry is moving rapidly toward bulk handling of raws. Three small mills owned by C. S. R. in New South Wales are already handling bulk. One trucks to their refinery at Brisbane, and two ship by boat to Sydney.

In 1957, a bulk plant will be in operation at Mackay. It will have an annual capacity of 300,000 tons and storage for 150,000 tons. Sugar will be handled from seven mills in the area.

In 1958, Lucinda Point bulk terminal, with a capacity of 140,000 tons and storage for 80,000 tons, will be in operation. Also, a Bundaberg bulk installation with 80,000 annual capacity and 50,000 ton storage capacity will be ready for use during the same season.

Later, Townsville will have a bulk terminal. Engineers have been appointed but dates of completion have not been announced. A local bulk sugar organization named by the Sugar Board, will handle each installation. The Sugar Board is financing the projects. As some 200,000 tons of bagged sugar will be required for export, the industry will not go exclusively into bulk handling within the foreseeable future.

One novel development projected for the new Australian installations is mounting of a television camera on the bottom of each gantry (the gantries will be similar to those in use at Hilo, Hawaii), so the operator can see to adjust the trimmer in loading. Also, in unloading bulk sugar at Pyrmont refinery at Sydney, C. S. R. does the job with a clamshell, using no men in the hold of the ship.

Victoria Mill, owned by C. S. R., is the largest raw factory in Australia. It has a capacity of 90,000 short tons. Inkerman Mill is second in size with 60,000 ton capacity. Incidentally, the Inkerman mill grinds cane grown only on irrigated areas.

Century Old Firm

Fletcher Works Accelerates Centrifugal Production

When Edward T. Taws, head of Brinton Machine Company and Pennsylvania Ribbon Manufacturers, heard rumors that Fletcher Works, located at Second and Glenwood Avenues in Philadelphia was in an unstable financial position he hurried to the offices of Morris Chaitlen, owner of Fletcher. Mr. Taws' concern was understandable in view of the orders for narrow fabric looms and centrifugals that Pennsylvania Ribbon Manufacturers had placed with Fletcher. Chaitlen, a successful Brooklyn candy manufacturer had acquired the century old firm in 1955. As a result of this meeting arrangements were made for the sale of Fletcher Works, U.S.A. to Taws and the deal including inventory was completed on January 13, 1956, just twenty-four hours after Mr. Taws' visit to inquire about the future of the Fletcher Works.

With the future of Fletcher Works in the dynamic hands of Edward Taws there occurred a development of interest to the sugar industry. The company, as men in the sugar industry know, has been closely tied in with the industry. Once known as Schaumn & Uhlinger, it is believed that Fletcher was the first to have made centrifugals in the United States of America. In fact, one of these early models, which dates back to the Civil War, is still on view in the company showroom.

Fletcher management likes to show this aged centrifugal because it illustrates the length of the company's experience in this work and is a marked contrast to modern, fully-automatic models.

The Fletcher plant occupies well over 200,000 square feet of floor space. The plant extends for several blocks, but its production facilities are so arranged that its various departments are individualized, flow of production is on a straight line.

Edward T. Taws of Fletcher Works, U.S.A. and one of his innovations; a showroom for the centrifugal division. Laboratory is shown at far left.

During the past 12 month period, Mr. Taws invested somewhat over $250,000 in modernizing the equipment and production lines. This program is a continuing one because demand for Fletcher centrifugals is such that production must be speeded up without sacrificing quality.

Not only has the physical set-up been completely transformed into a modern operation; the sales organization and policies have been reshuffled to provide integrated sales and service for customers. Outstanding is the Taws program of innovation in the marketing of centrifugals.

"We will merchandise the machines the same way automobiles are sold," Mr. Taws said, "We will put them on display, let the customer see them in actual operation, then provide complete and speedy service and replacement parts when needed."

To facilitate such demonstrations a showroom has been provided for the centrifugal division, which overlooks the centrifugal machine shops and assembly operation. A visitor to the showroom can operate any of the numerous centrifugal models in the 1200 square foot showroom.

Adjacent to the spacious and attractive showroom is an important department—the Fletcher Research and Testing Laboratory. This laboratory operates as a free service to anyone who wants materials tested.

A sample can be sent to the Fletcher laboratory for free tests, after which Fletcher chemists and engineers provide a report and recommendations. A Fletcher pilot centrifugal in the laboratory can be used by a qualified representative of a sugar company.

Another auxiliary service is a 24-hour consultation service in any part of the nation. Mr. Taws realized, after studying the centrifugal industry, that if an operation goes wrong in the Rocky Mountain area, a company can hardly afford to wait for several days until an engineer flys out. Instead, a series of specially trained Fletcher engineers has been established in various parts of the country to provide free consultation almost at a moment's notice.

Another important development of the new Fletcher management is its special parts department, where an inventory of over 150,000 parts are neatly categorized and stored 10 feet high. This department alone occupies some 25,000 square feet of floor space within the plant.

"We do not want anyone to have to delay production waiting for a part," Taws explained. "That is why rapid part replacement became a primary objective to us."

On the assembly line the engineering de-

partment has established check points at each stage of production. Parts are continuously checked for possible flaws. After all moving and fitted parts pass inspection, a mechanical operation test is conducted before shipment.

Mr. Taws considers this quality control an important economy because it is proof against service calls. In addition, it is good public relations, as the Fletcher president pointed out, because a customer who receives a machine in perfect operating order will be back again in the future.

In addition to centrifugals for the sugar industry, Fletcher also builds other models for the chemical, laundry and dry cleaning industries. A battery of them was recently completed for the Atomic Energy Commission.

"We are always striving to make improvements, increase efficiency of operation, develop new equipment," stated Mr. Taws. For this purpose he has set up a Research and Development section. One of their recent achievements has been the completely automatic suspended centrifugal which requires one setting, one push of the starting button—and goes through the same cycles repeatedly without the need of manual adjustments.

Expanding The Sugar Market Through Scientific Research

By John L. Hickson

On November 8, 1956 John Hickson addressed representatives of the Cuban sugar industry gathered at Havana for the annual meeing of the Cuban Sugar Technologists. Mr. Hickson, Assistant to the President of the Sugar Research Foundation, gave, in effect, a progress report on the work of the Foundation which, it is thought, will be of interest to sugar men throughout the world.—Editor

My purpose in speaking today is to explain to you what the Sugar Research Foundation is trying to do; how we go about doing it; and something about what we have been able to accomplish.

The Foundation was organized in June of 1943 with a broad purpose; to seek new knowledge about sugar and to seek ways of increasing the markets for sugar. This challenge, it seemed, could be best served by concentrating the attack on no one facet of research but to advance against many goals simultaneously.

One factor considered to affect the United States market was the antagonistic attitudes toward sugar which many of our people have held. Some of this antagonism has been traced to writings in the 1640's, when several English physicians blamed sugar for scurvy, consumption, dental caries and nearly any other ill which fell to the lot of mankind for which specific causes were not known. It is not irrelevant to comment that this was the era of the Round Heads, the Puritans, of Cromwell and the early austerity period. Sugar because of its sweet taste and ready refreshment provided an oasis of good eating in a desert of drab cuisine. This incensed the straight-laced Puritans who believed that anything enjoyable was the work of the devil. But, in not many years the use of citrus juice to provide vitamin C drove scurvy to near oblivion in the English navy. Koch isolated the microorganisms which would cause tuberculosis and the wind spilled out of the sails of these first charges. Did this squelch the antagonists? Not in the least. They merely revised the bill of particulars. Even in this year, 1956, pamphlets and books proclaim sugar to cause polio, the common cold and the ravages of old age. The light of medical discovery will not kill these pests, it will merely chase them into new corners.

However, in 1946 a poll of the American public disclosed that its chief apprehensions about sugar were threefold: Fear of obesity, of diabetes, and of tooth decay, each somehow linked in their minds to the weakness of a sweet tooth. You have already heard how each phrase of the obesity syndrome has been exposed to the cold light of unbiased observation. The truth is now being told to our people and the world. Sugar instead of being the villain is now known to help in combatting the disorder. Sugar can supply the energy to sustain a person who must endure a reducing diet. It also can be used to keep a tight rein on an overactive appetite. This story of sugar's role in helping to control overweight is the theme of our $850,000 advertising and public relations campaign. But please remember that research was carried on from 1943 to 1953 before sugar was in a position to speak up so boldly in its own defense.

In the matter of diabetes, Cuba's own Dr. Thomas Duran-Quevedo and Dr. Carlos P. Lamar, Canada's Dr. I. M. Rabinowitch, and a handful of other courageous medical researchers have had the daring idea that traditional methods of controlling diabetes have been not simply inadequate, but even an aggrevation to the disorder. For many decades sugar, fruit, breads, and starchy vegetables have been denied the diabetic. The unfortunate has punctured himself daily to pour insulin into his system and still he obtained only temporary sucrease from his disorder. Gangrene, blindness, edema, loss of brain function and countless other disorders attacked him. For nearly 20 years, however, it has been known to the men I have named that such rigid restrictions of sugar and carbohydrate was the wrong way to control this disorder. These men restricted the fat, fed fruit and honey; used minimal doses of insulin and each has cited evidence from case after case where diabetics have been restored to useful, happy lives. But they have been voices crying in the wilderness, and their story of hope has been almost completely lost in the general condemnation by the medical profession. The doctors say that such a drastic reversal of treatment couldn't be right and refused to test it. In this case the research has received but little support from the Foundation until very recently when we have been assisting in a demonstration. We hope, however, to be able to assist in the compilation of the facts, and hope that the information will soon be disseminated to the medical profession and to the public.

I have made these two extended explanations to tell you why it was deemed necessary for the Foundation's research to be pointed first at destroying delusions about sugar.

Now I shall speak of another defensive problem. With the rise of the fourth decade in this century, sugar pre-eminence as a food sweetener was assailed by other substances. The starch industry discovered that it could profitably produce dextrose or corn sugar, as well as corn syrup. It began to flood the market with these products and was willing to claim any or all of sugar's virtues in competing for its market. One early attack was made by circulating the idea that a principal fault of sugar was that it was too sweet. The corn industry did a good selling job, for many people now believe that flavors are masked by sweetness, and that sweet things are not refreshing. Eventually the United States Food and Drug Administration issued specifications for canned fruits making it allowable to substitute with dextrose for as much as a third of the sugar in the syrup used in canning fruits without stating the fact on the label. Our opponents said that the public couldn't tell the difference. Now, after three years of research at the University of California, we know that people can tell the difference. Americans do like the sweet taste. In fact, they prefer peaches canned with 25 per cent more sugar than the canners now use, even if they used no corn products at all. However, the comments of the more than 5000 tasters who have par-

ticipated in the tests were usually that the sweeter peaches tasted better not sweeter. They had a more peachy flavor than the less sweet pack. Already canners have begun to swing back to all-sugar packs because they are convinced that a better-tasting product will mean bigger sales.

The comment of the tasters, however, was highly significant. You remember I reported that they said the sweeter peaches had a stronger peach flavor. This started us on another interesting search. To a carefully trained taste panel, we presented mixtures of water, sugar, fruit acids and synthetic fruit flavors. The panel could tell with complete confidence which samples were more sweet and which were more sour, and combinations would not fool them. But, as we studied combinations of sweetness and fruit flavor, they became confused. If we held the sweetness constant, they could tell when we increased the flavor and if we held the flavor constant and increased the sugar, they could discern that the sweetness had increased. However, they also reported that we had increased the flavor. Here is an interesting problem. Sugar is detected in solution in the mouth. The taste-buds are on the tongue walls of the mouth. Fruit flavor is not detected here (unless it might be a little bitter). The molecules of the flavor must escape from the solution and rise up into the nose for us to detect them. This seems a paradox for as one adds a substance to the solution which cannot reach the nose, it liberates another substance from the solution. It is here that the fine thinking of Dr. Hass, our president, provided an explanation. This lies in the theoretical term of the physical chemist; fugacity. Sugar appears to bind so many of the water molecules to itself that they cannot exert their hold on the fruit flavor. Hence, it is more free to escape to the gaseous state and reach the nose. In a few months the theory was proved in the laboratory and at the September meeting of the American Chemical Society a report was presented. Sugar can cause a food aroma to escape as much as 30 per cent faster than it escapes from water. It is no accident that foods taste better when they are sugared. A telling blow was struck in the skirmish with the corn people when we found that corn sugars have only a third to a half the effect on fugacity that sugar has. It has taken considerable research to prove what should be so obvious; people do like a sweet taste.

In the soft drink industry the total business done by the coal tar sweetened beverages was less than one hundredth the increase in business done by sugar sweetened drinks. Recently, an officer of one of the largest soft drink manufacturers told me, "Don't worry, we know that you can't make a satisfactory soft drink with a substitute sweetener. We have no intention of using anything else than sugar."

The above examples serve to demonstrate what the Foundation has done in trying to preserve sugar's position in foods. We are convinced that this is our major market. Hence, even now we continue to study other problems in the edible uses for sugar.

In casting about for possible users for sugar, it did not take very long for us to recognize the potentials of the animal feedstuffs industry. The basis for most of our meals is meat. In the United States, our meat is principally beef, followed closely by pork, chicken, lamb, veal, turkey and fish. In 1953 Americans consumed 13.7 million tons of meat, which had been raised on 123.5 milion tons of feed concentrates, excluding forage. By 1975 it is estimated that we will devour 19.8 million tons of meat, which will require 178.4 million tons of feed stuffs. The consensus of specialists in the United States Department of Agriculture's land grant colleges was that in 1975 there would be available only about 165 million tons of conventional feed stuffs. Someone must find a way of providing economically the 13 million tons of additional animal feed or the price of meat will rise inordinately.

The history of the sugar business, we think, provides the answer to this problem. Since the early days of this century, molasses has been finding an ever-increasing market in cattle feeding. It has long been known that 6½ gallons of molasses have the same value to cattle as a bushel of corn. In Albany last year the farmers paid an average of $1.37 per bushel of corn and an average of 12¢ per gallon of molasses. At that price for corn the molasses was worth 21¢ a gallon. This year the price in Albany has risen to 18¢. It is small wonder that in 1955 more than 400 million gallons of blackstrap, refinery and beet molasses were fed to American cattle. The source of this molasses is the sugar business. No more molasses can be produced without increasing the market for sugar. Several sugar companies are working on this problem but the present rate of expansion of the sugar business does not meet the increased demand for molasses. This is why there is scarcely enough molasses available to meet the present market. However, at 18-21¢ a gallon the feeder is paying 3-3½¢ a pound of sugar. I have been told by several Cubans that Cuba can produce a high test invert molasses or a dried cane juice at 2-2½¢ per pound. These products can be produced independently from sugar production. As such the Cubans can continue to produce sugar to fill a major part of that 13 million ton deficit in feed production predicted in 20 years.

So far I have been speaking only of the cattle business. But we are not stopped there. One major, almost untouched potential market for sugar is the poultry feed business. In this market blackstrap molasses can never expect more than 1 to 3% of the business. Hence 30 to 90 thousand tons or 5 to 15 million gallons of molasses will satisfy this market. Dr. M. M. Rosenberg of the Hawaiian Agricutural Experiment Station pointed out to us that a significant fraction of chicken feed could be sugar and the birds would thrive economically. We have continued these studies and have more in progress at the Wisconsin Alumni Research Foundation. We know that the birds thrive when a fifth of their ration is sugar. We also know that four-fifths of a ration can economically provide all the protein, vitamins, minerals and other substances that a bird can use. We have fed dried cane juice, high-test invert molasses, raw sugar and refined granulated. Any and all forms provide the same results. The birds do well, and we can well expect the farmers to find no fault with the feed.

These are exciting chapters in the story of the Sugar Research Foundation. They point out the way in which the sugar business may accelerate the growth of its markets.

First a report on the sugar ester detergent. As it now stands, the Foundation has granted four foreign licenses and three domestic licenses. We are informed that shortly after the turn of the year, two plants will be producing in the United States. Our interest and hopes in this work continue undiminished.

Applications for patents have been filled on three pesticides which show considerable promise; one is a rat killer, another a herbicide and the third, a miticide.

A week or so ago we visited the Bjorksten Research Laboratories in Wisconsin and were given samples of sugar plastics which could be produced for less than 15¢ a pound. The materials have startling properties of strength, low color and resistance to water. In all probability this will be the first successful sugar plastic.

In Florida we heard from Professor George K. Davis that ammoniated bagasse pith is a highly satisfactory fodder for cattle. He finds beef animals can be wintered or fattened and dairy herds can continue satisfactory production on the product. Still further tests are being set up. This will be a boon to the Cuban cattle industry. Even more dramatic, however, is the promise for Central America, India and Africa where as many as half of the native children die because they now do not get enough protein. This could be remedied if they were supplied with meat or milk.

From 1943 to 1952 four countries of which one was Cuba joined in the support of Sugar Research Foundation's program for the sugar industry. Now we have members in eleven countries. We conduct research in three countries and hope to be able to establish two projects in Cuba. This will be done as soon as we can fit it into our budget.

FLETCHER

short stroke Dry Air and CO_2 Gas pumps

AIR CYLINDER Diameter	AIR CYLINDER Stroke	GROSS DISPLACEMENT Cubic Feet per Minute	SPEED Revs. per Minute
12"	8"	370	350
18"	10"	880	300
24"	12"	1,570	250
30"	15"	2,460	200
36"	15"	3,530	200

ALL PUMPS LISTED ABOVE ARE SINGLE STAGE AND DOUBLE-ACTING

Fletcher Air and Gas Pumps, are liberally valved, thus maintaining low gas velocities. High lift stainless steel valves of extra-large area are mounted radially on the outside of the cylinder of the gas pump for easy accessibility, and in the end covers of the air pump. The large area of the valves reduces friction and carbonization to give coolness and long life.

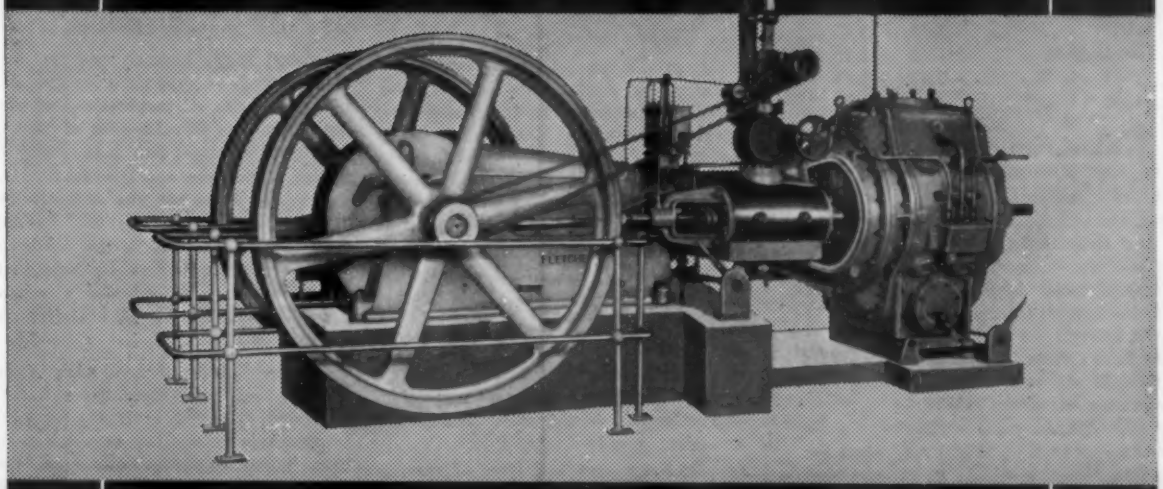
Additional features are the ring-oiled white-metalled main bearings and needle roller bearing to the crosshead pin. Either type of pump may be steam or electrically driven.

Complete plant for the sugar industry

Cane Knife Sets – Maxwell Shredder – Fletcher Mills — "Atlas Metal" Mill Rollers — Maxwell Boulogue Liquid Scales — Fortier Clarifier — Sealed Downtake Evaporator — Centre Flow Pan — Fletcher Crystalliser — Amarilla Rotary Displacement Pumps for Massecuite and Viscous Liquids.

FOR FURTHER DETAILS, SEND FOR OUR LEAFLET No. E.15

cool with constant efficiency



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facts about sugar

INTERNATIONAL political developments had a profound effect on sugar markets during the latter part of 1956 and conceivably may become an important factor in determining inventory policy in 1957, according to B. W. Dyer & Co., sugar economists and brokers. The No. 4 spot (world) price on the N. Y. Coffee and Sugar Exchange hit a peak of 5¢ per pound on November 28, declined to 4.60¢ a few days later, but then climbed higher and reached 5.15¢ on January 3.

The sharp rise in world prices during the latter part of December and early January followed substantial German and Japanese buying and a report that Russia would be unable to obtain some 200,000 tons of the sugar which Poland had been expected to supply in 1957.

Sugar Prices, January 4

Ex Duty Raw Sugar, N. Y.	5.90
Average No. 6 Raw, Jan. 2-4	5.90
Refined Sugar Gross, N. Y.	9.10
No. 4 Raw Sugar (f.o.b.) Cuba	5.15
Average No. 4 Raw, Jan. 2-4	5.13

Future Prices	*Contract No. 6*	*Contract No. 4*
Mar., 1957	5.82	5.15-.17
May, 1957	5.82	5.15
July, 1957	5.85	5.15
Sept., 1957	5.87	5.15
Mar., 1958	...	4.78

U. S. sugar requirements for 1957 were set at 8,800,000 short tons, raw value, which approximates the total estimated normal demand for the full year. In doing this, the Department of Agriculture deviated from the customary procedure of recent years, when initial quotas were set well below expected demand. On January 11 the Department of Agriculture increased United States quota from 8,800,000 to 9,000,000 tons, at the same time increasing beet acreage from 932,000 to 950,000.

As 1956 refined sugar deliveries are expected to approach 8,850,000 tons when the final figures are released, it appears that about 200,000 tons of refined sugar moved into "invisible" inventories during the year. The U. S. D. A. believes that the initial 1957 quota (8,800,000) will provide for a total of refinery and invisible stocks of quota sugar at the end of 1957 approximately equal to that at the end of 1956.

Domestic spot raw sugar prices remained unchanged at $5.85 per 100 pounds after the quota announcement, but then advanced to $5.90 on January 2.

In order to distinguish between raw and direct-consumption sugar, the U. S. D. A. has proposed a quality standard essentially at 99°, with a tolerance of 0.20° for crystalline sugar. The standard for non-crystalline sugar apparently is a total sugar content equal to not more than 99% of total soluble solids content with a tolerance of 0.20%, and ash content equal to not less than 0.20% of total soluble solids content, with a tolerance of 0.020%. These standards are to be used in conjunction with the processes specified in the Sugar Act (i.e., affination or defecation; clarification; and further purification by adsorbption or crystallization).

The 1957 acreage allotment for sugar beets has been increased from 885,000 to 932,000 acres. U. S. D. A. officials state that the increase was necessary to assure production of enough beet sugar to meet 1957 needs and carryover requirements for 1958.

The International Sugar Council has tentatively set 1957 quotas at 4,573,375 metric tons, raw value, or at the same level as the final 1956 quota. However, if the new protocol is ratified, quotas become inoperative when prices are above 4¢ per pound.

World production of centrifugal cane and beet sugar during the 1956/57 crop year will be about 44.5 million short tons, raw value, compared with about 42.8 million tons in 1955/56, according to U. S. D. A. estimates. Western European production is expected to be about 300,000 tons below that of last season. Cuban output is expected to show a substantial increase and significant gains are predicted for Argentina, Brazil, Turkey, India, Mexico and the U. S.

Trading on the New York Coffee and Sugar Exchange during 1956 was marked by greatly increased activity in sugar during the latter part of the year, Leon Israel, Jr., president, reported to members.

"In spite of a very low level of trading during most of the year," Mr. Israel stated, "totals for the year were 1,725,150 tons in Contract No. 4, compared to 1,172,950 tons in 1955, and 1,695,800 tons in Contract No. 6, compared to 1,667,700 in 1955."

The increase in sugar prices was attributed by Mr. Israel "to a belated recognition of a stronger statistical outlook and the tense international crises with the resultant demand for prompt shipment of sugar. It was evident, however, even before these crises arose that stocks were gradually being reduced with the supply and demand more nearly in balance. . . . We can look forward to continued activity during 1957."

Optimistic Outlook in Puerto Rico

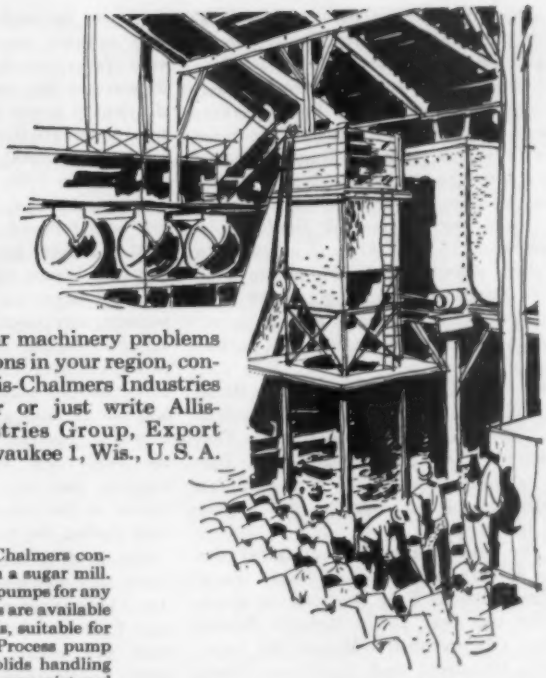
Lifting of marketing controls that will permit harvesting all standing cane during the 1957 campaign, along with the improved prices for sugar and molasses, has infused a justified optimism into the Puerto Rican sugar industry. Problems still remaining are the need for further mechanization of farming operations, the scarcity of labor, and the negotiation of contracts with unions for both field and factory workers. Insular Secretary of Commerce and Agriculture Luis Rivera Santos has called a meeting of labor and industry spokesmen to solve all existing problems ahead of time, so that all available cane may be harvested. All persons have promised full co-operation. Secretary of Labor Fernando Sierra Bardecia is arranging for better distribution of the Island's labor force so that fewer workers will have to migrate to the United States to find work.

Several sugar centrals and the Bull Insular Line have organized the Sugar Service Company, a corporation which will build facilities for shipment of bulk sugar through the port of San Juan. Participating in this corporation are Eastern Sugar Associates and some of the centrals on the northern coast; facilities will be used by most of the factories in the northern and central districts. Orders for equipment already have been placed, and it is expected that the installation will begin to operate in April or May, 1957.

Central Coloso is developing a project for shipping bulk sugar through the port of Aguadilla on the northeast corner of the Island. A large number of centrals already have begun shipping bulk sugar through the ports of Aguirre and Guanica. When work at San Juan and Aguadilla is completed, facilities will be available for shipping all of Puerto Rico's million-ton quota.

In setting up initial U.S. sugar requirements for 1957, the U.S.D.A. has specified a figure of 110,000 short tons for Puerto Rican local consumption. The Island's production quota has been set at 1,214,130

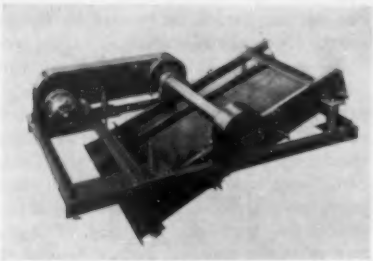
Peak Production with Allis-Chalmers Sugar Mill Equipment



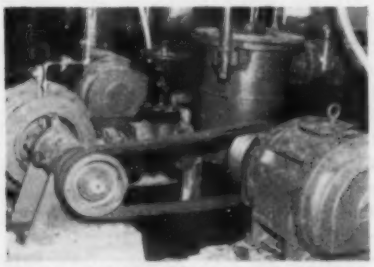
Allis-Chalmers offers single-source responsibility for a wide range of equipment to meet the needs of the sugar mill. This equipment is designed and built to work together for the highest possible sugar production at the lowest possible cost.

For help with your machinery problems or list of installations in your region, consult your local Allis-Chalmers Industries Group distributor or just write Allis-Chalmers, Industries Group, Export Department, Milwaukee 1, Wis., U. S. A.

HERE IS A LINE-UP of Allis-Chalmers condensate pumps, installed in a sugar mill. Allis-Chalmers can furnish pumps for any application in sugar. Pumps are available in a wide range of materials, suitable for any station in your mill. Process pump capacities to 1200-gpm; solids handling pumps to 10,000-gpm. Pumps pictured are driven by Allis-Chalmers motors.



ALLIS-CHALMERS VIBRATING SCREENS are widely used for removing bagasse and bagacillo from cane juices. Low maintenance-low operating costs result in profitable screen operation. Allis-Chalmers screens are offered in a full range of sizes for all sugar mill applications. Available with stainless steel cloth, and separately tensioned backing cloth.



ALLIS-CHALMERS MOTORS AND V-BELT DRIVES offer compact, economical and efficient power transmission for sugar mill duty. Motors in squirrel-cage, wound-rotor, synchronous and dc types are furnished with any necessary electrical or mechanical modifications. *Texrope* drives are available in special materials from fractional to 6000-hp constant drive sizes.

SWITCHGEAR AND ELECTRICAL EQUIPMENT from Allis-Chalmers are widely used in the sugar industry. Switchgear is factory assembled with all components in place, ready for operation. A-C metal enclosed switchgear is unsurpassed for dependable control and distribution of electric power to sugar mill machinery. Allis-Chalmers also supplies steam turbines, generators and control.

Texrope is an Allis-Chalmers trademark.

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ALLIS-CHALMERS DISTRIBUTORS

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These firms distribute equipment of the Company's Industrial, Power and Electrical, and General Product Divisions. Distributors of Tractor Division products also are located in principal cities.

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BOLIVIA, La Paz—Compañía Comercial e Industrial "Titan" S. A. (Texrope only)

BRASIL, São Paulo y Rio de Janeiro—Sociedade Técnica e Comercial Serva Ribeiro, S. A.; Recife (Pernambuco)—Schenker, Barbosa & Cia; Porto Alegre—Bromberg Comercial, S. A.

CHILE, Santiago—Salinas, Fabres & Cia. Ltda.*

COLOMBIA, Barranquilla—Osorio & Cia, Ltda.; Bogotá—Alsoco, Ltda.;* Medellín y Cali—Peter Santa María & Cia., Ltda.*

COSTA RICA, San José—Distribuidora, S. A.

CUBA, Habana—L. G. Aguilera & Co., S. A.

DOMINICAN REPUBLIC, Ciudad Trujillo—Dominican Motors Co., C por A.*

ECUADOR, Quito—Luis A. Hernandez.*

EL SALVADOR, San Salvador—Compañía Importadora de Maquinaria.*

GUADELOUPE, Pointe-à-Pitre—Société Commerciale Guadeloupéenne.*

GUATEMALA, Guatemala City—Compañía Distribuidora Kepaco, S. A.*

HAITI, Port-au-Prince—Electra.

JAMAICA, Kingston — Kingston Industrial Agencies.*

MEXICO, México D. F.—Allis-Chalmers de México, S. A.

NICARAGUA, Managua—Automotive and Industrial Equipment Co.*

PANAMA, Panamá City—F. Icaza & Co., Inc.*

PARAGUAY, Asunción—Importadora y Exportadora del Litoral, S. A.*

PERU, Lima—Peruvian Trading Corp., Ltd., S. A.

PUERTO RICO, Ponce—Porto Rico Iron Works, Inc.;* San Juan—Garcia Machinery, Inc. (Texrope products only.)

REPUBLIC OF PHILIPPINES, Manila, Bacolod City—Negros Occidental; Cebu, Manila—Earnshaws Docks & Honolulu Iron Works.*

SURINAM, Paramaribo, Nieuw-Nickerie—N.V. Ingenieursbureau H. N. Van Dijk.*

TRINIDAD, Port of Spain—J. N. Harriman & Co., Ltd.*

URUGUAY, Montevideo—J. Felix Castillo (H).

VENEZUELA, Caracas—Compañía Anónima Tecnomat.

ALLIS-CHALMERS MANUFACTURING COMPANY, Industries Group, Export Dept., Milwaukee 1, Wis., U. S. A., Factories in U. S. A., England and Canada

short tons, plus the 110,000 tons for local consumption, which involves no decrease in area planted.

The Puerto Rico rum industry has been increasing its volume of sales, but there has been a drastic reduction in the number of distillers and rectifiers. Rum shipments to the United States increased to 1,636,000 gallons in 1956, the greatest volume since 1944, while the number of distillers decreased from 17 in 1949 to 7 in 1956. In 1949 there were 37 rectifiers, but in 1956 only 20. Rum inventories aging under bond have been fairly constant during recent years, amounting to about 18 or 19 million gallons.

There is no U. S. tariff on Puerto Rican rum, and sales to the continent amount to about $5,000,000 a year, excluding the Federal Excise Tax of $10.50 a gallon. This excise tax, amounting to $15 to $17 million annually, is turned over to the Puerto Rican treasury.

At the recent annual meeting of the Puerto Rican Association of Sugar Technologists, Antonio Roig was elected president for the year 1957; Roberto Muñoz Lefebre, vice-president; Miguel V. Capllononch, treasurer; and J. López López, secretary.

"Research with Sugar Cane Fertilizers," a bulletin recently published by the University of Puerto Rico's Agricultural Experiment Station, gives a summary of all research work on fertilizers done in Puerto Rico during the past 40 years. During this period consumption of fertilizers by Puerto Rican farmers has increased ten fold. In the 1951/52 season, the year of greatest sugar production on the Island (1,136,000 tons), cane growers used 420,000 tons.

New Mills in Thailand

Thailand took a determined step toward its declared goal of self-sufficiency in sugar with the announcement of the completion of a new cane mill during 1956. A second mill is planned for the near future, with the combined capacity of these two mills expected to total about 27,500 short tons of sugar. In 1955 Thailand imported about 42,000 short tons of sugar. The country's production during recent years has been somewhat over 60,000 tons and its consumption near 85,000.

Louisiana Records Outstanding Year

The year 1956 has been a good one for the Louisiana sugar industry, according to John B. Levert, president of the Louisiana Sugar Exchange. In a recent report Mr. Levert notes the detrimental effects of Hurricane Flossy and several early freezes but states that "the good has offset the bad."

"The yield of cane per acre," he reports, "has been less than the record breaking production of 24.4 tons per acre of last year, but the yield of sugar per ton of cane has been the highest on record. The mediocre growing season has been offset by a very favorable harvesting season and it appears at this writing that the 1956 production of sugar in Louisiana will amount to at least 440,000 tons, raw value. This is only about 15,000 tons less sugar than was produced in 1955, despite the fact that our cane acreage for 1956 by Government decree was reduced more than 15%."

Mr. Levert lauds the amended Sugar Act, which now allows Louisiana and other domestic areas to participate in increased-consumption sugar allotments. "Louisiana and Florida," he states, "have been allowed to market over 100,000 tons more sugar in 1956 than the marketing allotment for 1955 and our farmers already have been granted a fifteen percent increase in acreage for the 1957 crop. There is every reason to suppose that we will enjoy a steady increase in the allowable acreage for sugar cane during the years that lie ahead."

Commenting on price tendencies, he notes that the administrator of the Sugar Act "has apparently been waging a one man fight against inflation using the sugar cane and sugar beet farmers as guinea pigs. . . . Because of circumstances beyond the administrator's control, the price of sugar has improved this year and, while we are not overly optimistic over future prices, we are, nevertheless, thankful for the fact that sugar is selling for a little more money now than it was at this time last year." The price of blackstrap molasses, he adds, is considerably higher than last year.

Mr. Levert comments on the continuing trend toward bigger and better cane mills, noting that the 1956 crop was handled by only 49 mills. Ten years ago 60 mills were in operation but they produced only 331,128 short tons of sugar, over a hundred thousand tons less than is estimated for the recent campaign.

"The small mill, like the small cane farmer," Mr. Levert concludes, "has been caught in the squeeze of rising production costs and lower sugar prices and has been eliminated, but the Louisiana sugar industry has done a very fine job in improving both field and milling techniques, and these improvements coupled with the new sugar legislation make the future look brighter than the past."

As in past years, a group of Louisiana cane experts recently have gone to the U.S.D.A. Field Station at Canal Point, Florida, to talk over problems of developing new sugar cane varieties with Dr. A. B. Belcher and his co-workers. Heading the group is Steven C. Munson, chairman of the Contact Committee of the American Sugar Cane League, and accompanying him, Dr. S. J. P. Chilton, head of the Department of Plant Pathology, L. S. U.; Lloyd L. Lauden, agronomist of the American Sugar Cane League; and Messrs. Louis Arceneaux and Malcolm Duhe, who conduct field increase stations on their farms in Louisiana. Dr. H. M. S. Tysdal, head of the Sugar Crops Section of the U.S.D.A. Agricultural Research Service, is scheduled to meet the group in Florida.

Receipts of offshore raws at New Orleans during the month of December were as follows: 14,091 tons of Cubas to American; 8,706 tons of Cubas to Colonial; 7,882 tons of Cubas to National; 6,354 tons of Cubas to Henderson.

Second Bagasse Paper Plant for Cuba

During 1956 Cuban exports of sugar and cane by-products were at a high level. Exports during the first seven months were valued at $344,390,273.

Among significant events in Cuba during the 12 months just past was the appointment of Dr. Gaston Godoy as president of the Cuban Sugar Stabilization Institute (I.C.E.A.) back in July, and a few months later, appointment of Dr. Martinez Sainz as president of the National Bank for another four years. The year saw a lively meeting of the Technologists in November, celebration of Sugar Day, and the inauguration of two bagasse paper plants, one at Central Progresso announced early in the year, and the second, announced near the end of the year, to be erected on the south coast. (See page 31).

By government decree each of Cuba's 161 sugar mills was to begin grinding not earlier than January 1 nor later than February 15. Allowance was made for granting special exceptions to this rule, and Centrals San German and Cacocum, both in the province of Oriente, requested and obtained permission from the Ministry of Agriculture to begin grinding before January 1.

Sugar Use Outpacing Supply in Mexico

The Mexican sugar crop will hit a million metric tons in 1958, according to that country's Department of Agriculture. A thorough overhaul of the industry, new mills, and coordination of production is expected to achieve this goal.

The new mills, to be constructed in zones propitious for large scale cultivation of cane, will receive full official aid, according to Secretary of Agriculture Jesus Merino Fernandez. This usually means credits through official banks and a moratorium on tax payments for a period of from five to ten years.

Aaron Saenz, who surprised the industry by suddenly resigning some weeks ago as head of the National Union of Sugar Producers, has stated that there will be sufficient sugar for 1957 without the need of imports. (Mexico imported close to 60,000 short tons in 1956 to meet deficits.)

Mr. Saenz has predicted production of 940,000 metric tons in 1957 (about 1,035,-

000 short tons), which would be an increase of some 200,000 tons over 1956 and some 40,000 tons more than the productive year of 1955. The usually well-informed Weekly Review of Business, however, is not as optimistic as either Saenz or the Department of Agriculture. In an analysis of the current situation it states that "it is probable that the 1956/57 cycle will see a sharper decline from levels formerly established."

The magazine also has attacked official figures of a 211,334 ton reserve of sugar at the beginning of 1956. If there was such a reserve, the weekly asks, why then was it necessary to import sugar from Cuba?

Actually, a situation has been developing in Mexico where production is continually hard-pressed to keep up with climbing domestic demand. That is why new mills are imperative at this time, according to far-seeing official and industry observers.

A threatened sugar strike in Mexico was averted at the zero hour, and has been reflected in higher retail prices of 1.33 pesos (.1064 cents) for standard white sugar and 1.40 pesos (.1120 cents) for refined granulated. Both of these are new highs for consumers, and there are indications that still higher prices will prevail in 1957.

Efforts are being made to straighten out all the varied tangled problems of the industry. On the credit side of the ledger is the plan to create the Technical Sugar Institute of Cosamaloapan, as a part of the University of Veracruz. If things work out, the Institute will be functioning early in 1957, training technical personnel for the industry. Financing of the new institute has been largely underwritten by Roberto Garcia, director of Ingenio San Cristobal.

Varied Output in Pakistan

About a million acres of land are devoted to the cultivation of sugar cane in Pakistan, according to U. S. D. A. statistics. The major portion of the cane is used in the manufacture of gur (a non-centrifugal sugar) which is used all over the country but particularly by the poor and middle classes. A considerable quantity of Pakistan cane is chewed as a confectionery by the populace. Sugar cane juice is used as a drink and in cooking, and a certain amount of cane is fed to livestock.

Only small quantities of refined crystal sugar are manufactured each year. The 1956/57 crop of sugar is expected to total about 1.3 million short tons on a gur equivalent basis.

Hawaiian Crop Worth $147,000,000

The final figures for the 1956 Hawaiian crop—1,099,543 short tons—make it the second largest on record, exceeded only by the 1955 output of 1,140,112 tons.

Hawaii's 1956 sugar crop was worth an estimated $147,000,000 to the Islands' economy, according to the Hawaiian Sugar Planters' Association. Preliminary figures break down into about $130,000,000 for raw sugar, $7,000,000 for molasses and $10,000,000 for compliance payments.

Final returns to Hawaiian plantations from the California & Hawaiian Sugar Refining Corp. place sugar at $118.40 a ton and molasses at $27 a ton.

Hawaiian Sugar Production

To January 5, 1957	291 tons
To January 7, 1956	1,311 tons
Total 1956	1,099,543 tons

The Aiea refinery (C & H's plant in Hawaii) was scheduled to begin 1957 operations in mid-January. Aiea produced 58,688 tons of refined sugar in 1956, compared to 67,519 tons the year before, according to Leonard W. Crosby, manager.

Effective January 3, the Territory of Hawaii had 27 plantations instead of 28, as a result of the merger of Kaiwiki Sugar Co. into neighboring Laupahoehoe Sugar Co. Andrew Walker is the manager of the resulting Laupahoehoe Sugar Co., and Kaiwiki's former manager, David E. Larsen, has become head of Hamakua Mill Co. Kaiwiki, a Theo. H. Davies & Co. plantation since 1909, had a history of almost 80 years.

3 SPECIALLY FABRICATED TYPES!
Camels' Hair Solid Woven . . . Asbestos Bonded Woven . . . and Asbestos Hydraulic Compressed, each designed to perform smoother and with greater efficiency on specific sugar mill centrifugal operations.

PROVEN PERFORMANCE!
REDDAWAY linings' superior performance has been conclusively proven in a great number of sugar factories and refineries who are securing far longer lining and drum life, smoother stops, cooler operating brakes and friction clutches, lower maintenance and operating costs.

EXTRA WIDTH MEANS NO RIDGE!
All REDDAWAY brake linings can be furnished at full width to fit any industrial band or brake shoe. This extra surface gives increased efficiency and eliminates drum ridging.

SERVICE RECOMMENDATIONS

WATER COOLED BRAKES—Use REDDAWAY Solid Woven Camels' Hair Lining.

AIR COOLED BRAKES—Use REDDAWAY Bonded Woven Asbestos Lining.

FRICTION CLUTCHES—Use REDDAWAY Bonded Woven Asbestos Lining or REDDAWAY Hydraulic Compressed Lining.

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REDDAWAY MANUFACTURING COMPANY, INC.

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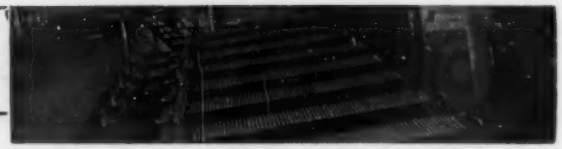
Manufacturers of—OIL FIELD BRAKE BLOCKS • TRUCK AND BUS BRAKE BLOCKS • AUTOMOTIVE AND INDUSTRIAL BRAKE LININGS • POWER TRANSMISSION BELTING

Personal press station



Hugh B. Eldred has been named president and treasurer of the Michigan Sugar Company by the board of directors at their annual meeting. He previously held the post of executive vice president and succeeds the late Geoffrey S. Childs.

Hugh B. Eldred

Since Mr. Eldred joined the company as auditor in 1940, he served as assistant treasurer, secretary, comptroller, assistant to the president and executive vice president.

He was associated with Price, Waterhouse & Company, Detroit, prior to joining this company. He is a director of the Farmers & Manufacturers Beet Sugar Association and a member of the American Beet Sugar Policy Committee and active in civic affairs.

■

W. R. Grace & Co. has announced the election of **Richard A. McDonald** as director and the appointment of **Wenthworth Brown** as head of the Paper Division of the Latin American Paper and Chemical Group.

Mr. McDonald was formerly executive vice president and chairman of the executive committee of Crown Zellerbach Corp. and was recently retained by Grace as a consultant on paper. In 1952 he was successively Assistant Administrator and Administrator of the National Production Authority in Washington, D. C. He is also a director and chairman of the Executive Committee of The East Texas Pulp & Paper Company.

Mr. Brown was previously vice president of Canadian Chemical and Cellulose Company, Ltd., of Montreal, Canada and vice president and general manager of its two subsidiaries in British Columbia.

Alfred E. Lewis, associate editor of SUGAR for the past five years, has resigned effective January 31 to engage in independent publicity and consultation service to manufacturers supplying the sugar industry. A graduate of the University of California and an industrial editor and writer for the past 15 years, Mr. Lewis contributed many authoritative articles to SUGAR on by-product developments and material handling methods. His writings were reprinted in sugar journals throughout the world.

■

Leon Israel, Jr. was re-elected president of the New York Coffee and Sugar Exchange, Inc., at the annual election of officers and managers recently.

Leon T. Israel

A member of the Exchange since 1929, he is president and a partner of Leon Israel & Bros., Inc. He is a member of the Board of Directors of several organizations.

President of Lowry & Company, **Charles S. Lowry** was re-elected vice president of the Exchange.

A vice president of the National Sugar Refining Company, **Mr. G. W. Knauth** was re-elected treasurer.

■

Roy J. Leffingwell, head of public relations activities of the Hawaiian Sugar Planters' Association for most of the past 11 years, resigned effective December 31. Mr. Leffingwell came to Hawaii as a colonel in the Air Force in 1943. On January 1, 1946, he joined the Hawaiian sugar industry as assistant public relations director under the late Richard V. Haller, who was then establishing the first PR staff in the industry. Upon Mr. Haller's death in 1948, Mr. Leffingwell became director.

■

C. A. Cocks, Convent Station, New Jersey, was appointed New York District Sales Manager of Johns-Manville Corporation Celite Division, it was announced recently by W. J. Bucklee, General Sales Manager of the Division. Mr. Cocks will be responsible for sales in New England, New Jersey, Maryland, Virginia, District of Columbia and parts of Pennsylvania. Mr. Cocks has been with Johns-Manville since 1939.

■

A. Howard Smith, Rochester, New York, has been named Manager, Commercial Research, by The Jeffrey Manufacturing Company, well known supplier to the sugar industry. Before he joined the company, Mr. Smith directed the business research departments for Robbins & Meyers, Inc. and Bausch & Lomb Optical Company.

■

Vice President in charge of raw sugar for Refined Syrups & Sugars, Inc., **E. T. MacHardy** has been named to the Sugar Research and Marketing Advisory Committee of the U. S. Department of Agriculture.

E. T. MacHardy

He was associated with the Department of Agriculture from 1934 to 1946.

Mr. MacHardy joined the Refined Syrups as an assistant vice president in 1946 and was appointed a vice president in 1955.

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SUGAR ABSTRACTS

Published under the Auspices of the International Society of Sugar Cane Technologists by Special Arrangement with SUGAR—Dr. O. W. Willcox, Editor

Sugar Factory Technology

Influence of Bagasse Fineness on Maceration Efficiency

Technical Report No. 35, June, 1956, Sugar Research Institute, Queensland.

Samples of final bagasse from several Queensland mills were examined for particle size and pol distribution. The pol concentration in particles larger than ½" was twice that of particles passing a ⅛" mesh sieve. For highest maceration efficiency the state of subdivision of the prepared cane should be limited only by the feeding characteristics of the product. In this connection the operational value of a combination of two sets of high-speed knives and a Searby shredder was demonstrated.

■

Amino Acids Present in Some Samples of Final Molasses and of Cane Juice

Technical Report No. 33, February 1956, Sugar Research Institute, Queensland.

By means of paper chromatograms, fifteen amino acids have been shown to be present in both cane juice and molasses; the presence of cystine in cane juice is doubtful. Proline and two other unidentified acids were present only in molasses, while two which were not identified (one perhaps phenylalanine) occur in cane juice only. Analysis of juice was made immediately after crushing the cane, and also after allowing the juice to stand for four hours in order to study the influence of enzymatic activity. However, the comparative chromatograms showed no differences. The effect of maceration was to increase the concentration of amino acids, relative to juice solids, in comparison with the composition of first expressed juice; but hot maceration did not show any difference in quantity or nature of amino acids as compared with cold maceration.

■

Recent Developments in the Chemical Cleaning of Evaporators

M. C. BENNETT, N. O. SCHMIDT, L. F. WIGGINS and W. S. WISE, *Proceedings* International Society Sugar Technologists, 9th Congress, India, Paper S.M. 10, (1956).

There has lately come into prominence a group of organic substances which have a remarkable ability to form highly soluble compounds with metal ions. These substances are known as "chelating" agents. Among these is ethylene—diamine tetra-acetic acid (EDTA) which readily dissolve insoluble metal salts such as calcium and magnesium phosphates, silicates and sulphates, and iron and aluminum. These insoluble salts are precisely the substances that constitute most of the scale that forms on the heating surfaces of sugar factory evaporators. The possibility that EDTA might come into use for cleaning out these encrusting substances became evident in 1953 when Wiggins and Schmidt showed that a 5% solution of EDTA completely removed every trace of scale from a length of badly scaled evaporator tube. Following this observation, extensive tests were made on evaporators in a commercial sugar factory.

After preliminary trials in 1954, a full-scale test was made during the 1955 crop which was carried out by the following procedure.

The product used was the sodium salt of EDTA sold under the trade name "Versene" as a 5% solution with the pH adjusted to 6-6.5. Circulation is effected by boiling, the vessel being filled to top of the tube plate. When this operation was repeated at weekly intervals the tubes were always satisfactorily cleaned; no brushing was required. Since Versene costs $0.60 per lb. it is advisable to regenerate it for reuse. For this purpose the used solution, which then has a pH of 4.0, is run into an acid-resisting plastic-coated tank and the pH reduced to about 3.0 by addition of sulfuric acid; this precipitates the scale-forming materials, which are allowed to settle out at a temperature of 50°C. The clear liquid is drawn off and the pH restored to about 6.0-6.5; this operation may be conveniently done in mid-week. A certain amount of soluble magnesium accumulates in the solution; this may be removed at the end of the season by acidifying to pH 1.5, and the solution is ready for the next crop. In most cases silica forms an insoluble sludge which is easily filtered out, but in some cases may require a caustic soda treatment. Losses of Versene amount to about 2% per week.

The long-term effects of this treatment include no pitting of the tube surfaces such as are caused by strong acids; no wear is caused by mechanical cleaning. A main advantage is the large saving of time; instead of 36 hours usual in West Indian factories, with Versene the operation requires, at most, four hours, and if the scale is light an hour's boiling is sufficient; another advantage is that Versene does really clean, and even removes the oxide film on the metal.

The facts cited above may be regarded as established; the test will be carried on in 1956 for a more extended study of details in another factory.

■

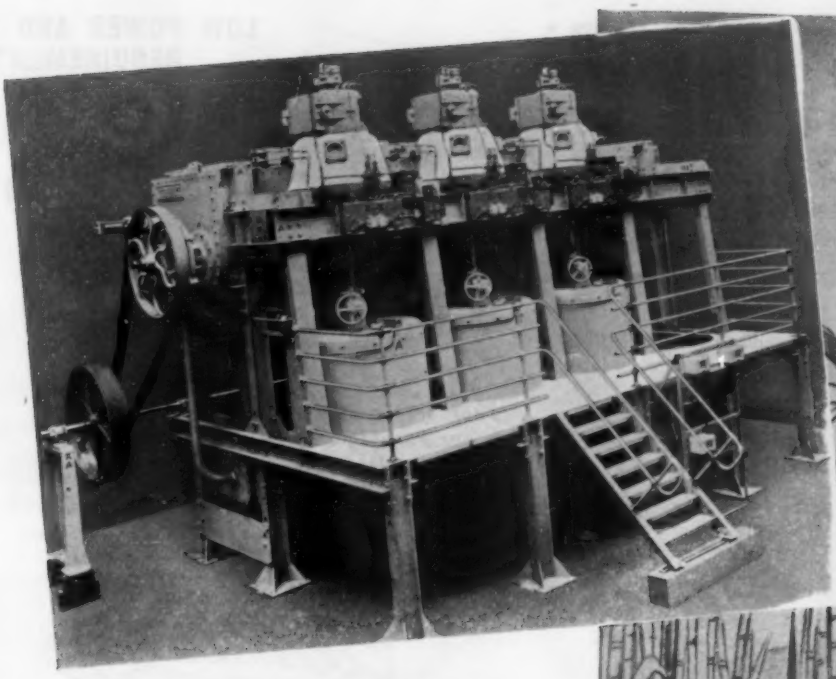
Cane Agriculture

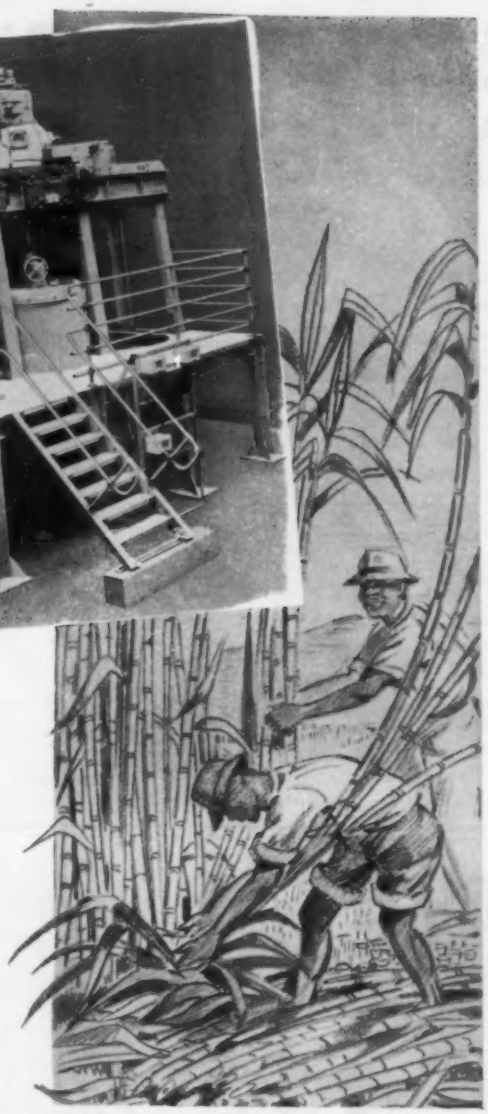
A Note on Rat Poisons

W. A. MC DOUGAL, *Cane Growers Quarterly Bulletin*, Vol. 20, No. 2, p. 43 (1956).

The Mackay Experiment Station has tested many commercial poisons including R42 or compound (Warfarin), against native rats that attack sugar cane. Where health risks prohibits the use of other poisons, Warfarin has achieved some success. However, as it kills rats only after appreciable intakes on at least three successive nights, feeding stations, which are expensive, must be used. On the other hand, Australian native rats are difficult to poison, chiefly because man-made intrusions seldom raise their curiosity to any great extent or interfere with their wanderings. In practice this means that the pests must be dealt with on a grid system with a 10 yard interval so that the broadcasting of poisoned material is not worthwhile. Most rats in moving populations make only a cursory inspection of poisoned food either as baits or at feed stations; the use of feeding stations does not improve pest kills but merely serves as a means of presenting larger quantities of expensive food material to native animals other than rats.

Satisfactory commercial poisoning in cane fields can be obtained





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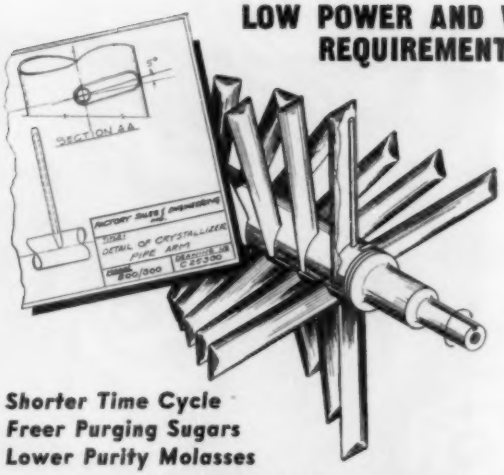

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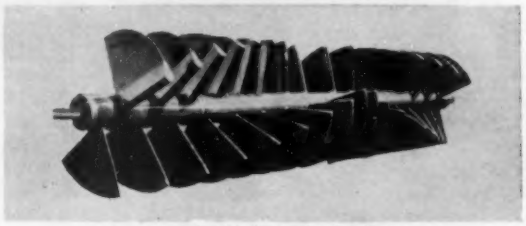

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only in settled rat populations, when some 80 percent, of the pests are killed by the intake during the first night after baiting. Obviously Warfarin, which is marketed under a number of trade names, is not a suitable poison to use when attempting this objective.

■

Books

Mexican Sugar Industry, Vol. 3

LA INDUSTRIA AZUCARERA DE MEXICO, Vol. 3, Parts I and II; equipment and systems of fabrication by factories and by regions; published 1955 by Banco de Mexico S.A., Mexico, D.F., 784 pages.

In 1947-48 the Banco de Mexico undertook a comprehensive survey of all Mexican sugar factories with the idea of accumulating a body of facts that would give an accurate picture of the existing state of this important Mexican industry, its actual capabilities, its defects, and the possibilities of improvement. Execution of this survey was entrusted to a team of distinguished sugar technologists with wide experience in various countries, headed by Professor E. L. Dennis of the Audubon Sugar School.

These experts visited every one of the factories, large and small, that were then in operation. They wrote descriptions of each major piece of equipment and studied the methods employed at that factory for transporting, unloading, weighing and preparing the cane for grinding; the grinding operations; the steam boiler plant with its accessories of bagasse conveyors, boilers and furnaces; the electric power plant and its equipment; the juice-handling equipment and the juice purification operations; the evaporation department; the vacuum pans, molasses tanks, crystallizers and centrifugals; the refinery department and methods of handling, storing, packing and shipping the sugar.

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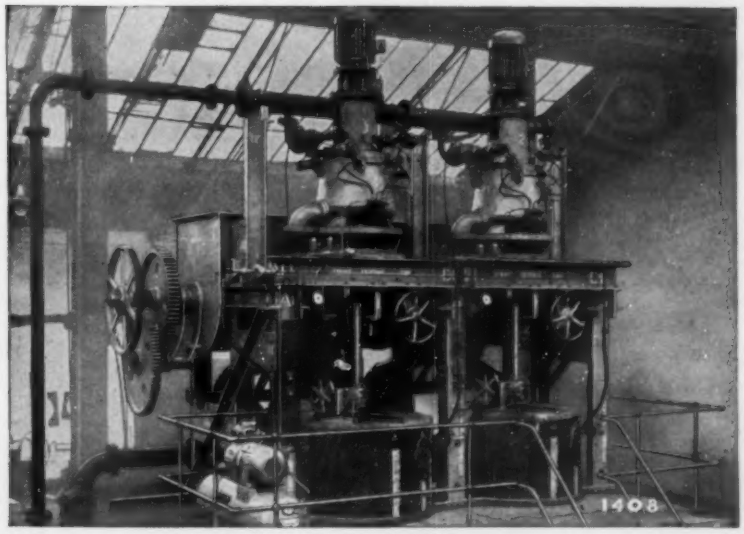

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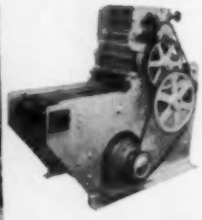

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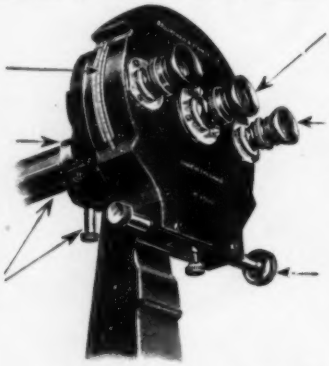

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absence of laboratory facilities for chemical control of the manufacturing processes, and extended their observations to general matters, such as water supply, repair shops, buildings, fire protection and accident prevention. To each report they appended comments pointing out defects and suggesting improvements. The factories were grouped in 14 more or less similar regions, with remarks on the possibilities of consolidating smaller factories into larger units.

That was in 1947-48. On the basis of the recommendations suggested by this first survey the Mexican sugar industry entered a new period of development and expansion and is producing annually about 770,000 tons of commercial sugar in 96 going factories not counting the still numerous small mills that produce piloncillo for local consumption.

To evaluate the later state of the industry the survey was repeated in 1953-54, and the results are embodied in the present report. The new report while registering general advances in practical technology, still shows the same picture of relative efficiency and inefficiency in different factories, and carries new, concrete suggestions for further improvements in the coming years. This monumental work gives the impression of being the most extensive and particularized description of a national sugar industry that has ever been written. The reader who diligently reads it will see the industry as a whole, and in each of its numerous component units. The first 106 pages are especially worth reading by every sugar factory technologist who is interested in knowing how the other fellow does it. Here the investigators will tell him what his Mexican colleagues are doing—and what they are losing through faulty equipment and lack of know-how. This section should be especially informative to apprentices and students who are preparing for careers as sugar technicians. The students' text books will tell them how the ideal cane sugar factory is operated; this report will show them the other side: how a cane sugar factory should not be run.

■

By-Products

New Kind of Sugar Beet By-product

E. J. MAYNARD, *Through the Leaves*, Sept.-Oct. 1956, pp. 21-25.

For some years the Great Western Sugar Company has been operating a factory in which monosodium glutamate (MSG) is manufactured. The raw material for this factory is the residual spent liquor, or Steffens molasses, from which all recoverable sucrose has been removed. After the MSG is separated there remains a solution containing impurities that were formerly considered to be of no value and were thrown away, but have now been found to contain considerable quantities of valuable feedstuffs which are recovered in the form of a "liquid protein concentrate" (LPC), containing over 63 percent of dry substance with a content of more than 33 percent of crude protein. This liquid protein product is being dried on all pulp produced in all the company's beet sugar factories, or used in liquid form as a feed-mixing ingredient to replace molasses and to increase the protein and reduce protein costs in feed rations for beef cattle, dairy cattle and sheep throughout Great Western territory.

Because of this new available supply of liquid protein the company no longer produces dried molasses-beet pulp and now produces high-protein dried-beet pulp which, in addition to the usual qualifications of dried pulp, contains over 16 percent crude protein or practically twice as much as is found in ordinary dried beet pulp. This includes not more than 3½ percent of equivalent crude protein from non-protein nitrogen, which is digestible in the stomachs of ruminant animals. In recent feeding experiments the new protein concentrate has been found to replace one-fourth to one-third of a more expensive grain ration in cattle-fattening operations, producing equal gains in weight and higher quality of meat and reducing fattening cost by more than $3 per 100 lbs., or $12 per head. It has proved equally effective when used to replace a part of grain and all the protein concentrate in dairy rations.

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(*Continued from page* 31)

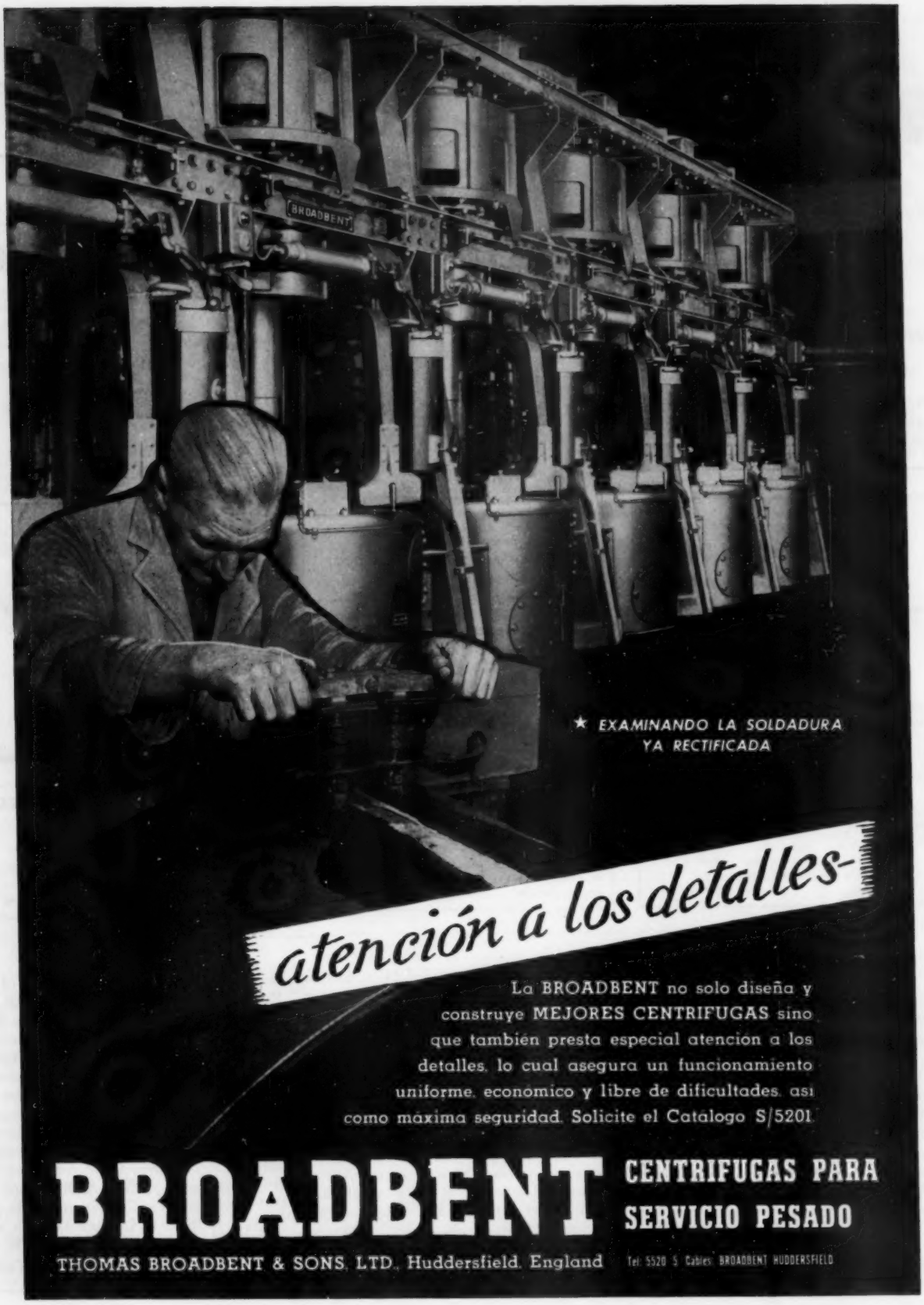
& Whittemore in the negotiations with Papelera Pulpa, has an extensive background in this field having been chief of the Pulp and Paper Branch, Economic Cooperation Administration among other things. Currently, in addition to his work with Parsons & Whittemore, he is a member of a task group studying possible utilization of agricultural residues for the Presidential Commission for Greater Industrial Utilization of Agricultural Products.

Correction

On page 56 of the October 1956 issue of Sugar y Azucar a serious error was made in abstracting a paper entitled "Clarification of Juices After Liming and Heating with Use of Polyelectrolytes" by John H. Payne and George E. Sloane which had been delivered at the 9th Congress International Society of Sugar Cane Technologists. In the abstract as published in Sugar y Azucar it was incorrectly stated that of two polyelectrolytes used in cane juice clarification, one was anionic and the other cationic. Purpose of this correction is to point out that the polyelectrolytes referred to were Lytron X 886 and Separan 2610 both of which are anionic. It should be emphasized that Lytron and Separan are trade names.

TAPPI Meets in New York

At a meeting of the Agricultural Fibers Session of the Technical Association of the Pulp and Paper Industry, to be held at the Hotel Commodore, New York, February 18th, three technical papers on Hawaiian activity in this field will be delivered. T. J. Nelson of the Hawaiian Sugar Planters Association will speak on the objectives of Hawaiian research, followed by a technical discussion on Bagasse Properties and Variables by Dr. J. D. Wethern of Crown Zellerbach, whose central research department conducted the HSPA-sponsored studies. S. B. Knapp of HSPA will describe Pulping Hawaiian Bagasse, D. D. Hinrichs, Crown Zellerbach, will discuss Bleaching Bagasse Pulps and W. W. Moyer will give a summary of Hawaii's Research.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Expansión del Mercado para el Azúcar a Través de Investigaciones Científicas

Por John L. Hickson, Auxiliar del Presidente, Sugar Research Foundation, Inc.

El 8 de noviembre de 1956, el Sr. John L. Hickson dirigió la palabra a los representantes de la industria azucarera de Cuba reunidos en la Habana con motivo de la conferencia anual de los Técnicos Azucareros de Cuba. En efecto, el Sr. Hickson, Auxiliar del Presidente de la Fundación de Investigaciones Azucareras, rindió un informe del progreso alcanzado en el trabajo de la Fundación, el cual se estima ser de interés para aquellos vinculados en la industria azucarera mundial. El editor.

MI OBJET en dirigirme a ustedes es explicarles lo qué la Sugar Research Foundation está tratando de hacer; cómo está procediendo en este sentido; y algo sobre lo qué ha podido lograr.

La Fundación fué organizada en Junio de 1943 con un amplio objetivo: Obtener mayores conocimientos sobre el azúcar y tratar en todo momento de aumentar el mercado para el azúcar. Al parecer, la mejor forma de hacerle frente a este problema no yacía en concentrar el ataque en una sola faceta del programa de investigaciones, sino en el logro de múltiples finalidades simultáneamente.

Uno de los factores que se suponía afectaba el consumo del azúcar en Estados Unidos era la actitud antagónica de mucha gente hacia este producto. Parte de este antagonismo se atribuye a los escritos publicados en 1640, cuando varios médicos ingleses culpaban al azúcar por el escorbuto, tuberculosis, caries dentaria y casi cualquier otra enfermedad que afectaba a la humanidad, para la que no se conocían causas determinadas. Cabe decir que esta fué la era de las cabezas redondas, de los puritanos, de Cromwell y del antiguo período de austeridad. Debido a su sabor dulce y adaptabilidad para refrescos, el azúcar ofrecía un oasis de alimentos agradables en un desierto de alimentos insípidos. Esto enfurecía a los estrictos puritanos quienes creían que todo cuanto fuese grato era obra del demonio. Pero, al cabo de pocos años, el uso de jugos cítricos ricos en vitamina C extirpó el escorbuto de la marina inglesa casi por completo. Koch logró aislar los microorganismos que causaban la tuberculosis, lo que cortó las alas de estas primeras acusaciones. Mas, esto no desvaneció el antagonismo en lo más mínimo. Lo único que ocurrió fué una simple modificación de la exposición de causas. Aun en este año de 1956 aparecieron folletos y libros declarando al azúcar el causante de la parálisis infantil, del catarro común y de los estragos de la vejez. La luz de los descubrimientos médicos no extirpará estas plagas sino que sólo las ahuyentará a otros parajes.

Sin embargo, una encuesta llevada a cabo en 1946 en norteamérica reveló que las principales aprensiones acerca del azúcar eran tres: Temor a la obesidad, a la diabetis y a la caries de los dientes, todo asociado en la mente de cierto modo con la afición a los dulces. Ya hemos oído cómo cada fase del síndrome de la obesidad ha sido descubierto por la luz fría de las observaciones imparciales. Ahora, la verdad se está dando a conocer a nuestro pueblo y al mundo entero. Ahora se sabe que el azúcar, en vez de ser el villano, ayuda a combatir este desorden. El azúcar puede suplir la energía necesaria para mantener a una persona que tiene que someterse a una dieta para bajar de peso. También se puede usar para poner rienda a un apetito excesivo. El historial del papel que el azúcar desempeña en regular el exceso de peso es el tema de nuestra campaña publicitaria y de relaciones públicas a un costo de $850,000. Pero recordemos el estudio llevado a cabo entre 1943 y 1953 antes de que el azúcar estuviese en posición de hablar tan decididamente en su defensa.

En cuanto a la diabetis, el Dr. Tomás Durán Quevedo y el Dr. Carlos Lamar de Cuba, el Dr. I. M. Rabinowitch del Canadá, y varios otros esforzados investigadores médicos concibieron la osada idea de que los métodos tradicionales de combatir la diabetis no sólo resultaron ser inadecuados sino que hasta llegaron a agravar el desorden. Durante mucho tiempo, el azúcar, las frutas y los vegetales ricos en almidón estaban vedados para los diabéticos. Los infelices se pinchaban diariamente para introducir insulina en su sistema, pero aun así sólo lograban aliviar su desorder temporalmente. Estos individuos eran atacados por gangrena, ceguera, edema, pérdida de la función del cerebro y múltiples otros desórdenes. Sin embargo, hace cerca de 20 años que los investigadores citados sabían que estas rigurosas prohibiciones de azúcar y carbohidratos no eran las indicadas para combatir este desorden. Estos médicos restringieron la grasa, prescribieron frutas y miel de abeja, y usaron dosis mínimas de insulina, y todos aludieron a la evidencia, caso tras caso, donde los diabéticos recuperaron su salud. Pero ellos han estado predicando en desierto, y sus recuentos de esperanza se perdieron casi por completo en la condenación general de parte de la profesión médica. La profession médica declara que una reversión tan radical del método de tratamiento no puede ser correcta y se negaron a probarla. En este caso, estas investigaciones han recibido muy poca ayuda de la Fundación hasta recientemente que tomó parte en una demostración. Esperamos, no obstante, poder ayudar a completar los datos convincentes y que esta información pronto será diseminada entre la profesión médica y el público.

Ahora hablaré de otro problema en defensa del azúcar. Llegada la cuarta década del siglo actual, la preeminencia del azúcar como dulcificante de alimentos fué asaltada por otras substancias. La industria almidonera descubrió que podía producir lucrativamente dextrosa o azúcar de maíz tan bien como sirope de maíz. De modo que comenzoó a inundar el mercado con estos productos, y al disputar el mercado estaba dispuesta a alegar que los primeros tenían cualesquiera o todas las virtudes del azúcar. Uno de los primeros ataques fué la circulación de la idea de que uno de los principales defectos del azúcar era su dulzura excesiva. La industria de maíz supo introducirse en el mercado, pues ahora muchas personas creen que los sabores están equiparados por la dulzura, y que las cosas dulces no son refrescantes. Por último, la Administración Norteamericana de Alimentos y Drogas (United States Food and Drug Administration) expidió especificaciones para frutas en conserva, permitiendo la substitución con dextrosa hasta un tercio del azúcar en el sirope empleado en conservas de frutas sin mencionarlo en la etiqueta. Nuestros contrarios dicen que el público no podía notar la diferencia. Ahora, después de tres años de investigación en la Universidad de California sabemos que la gente puede notar la diferencia. A los americanos les guesta el sabor dulce. En efecto, ellos prefieren que la conserva de melocotones se haga con 25 por ciento más azúcar del que las fábricas de conservas emplean ahora, aunque no empleen productos de maíz alguno. No obstante, el comentario de más de 5,000 catadores que participaron en las pruebas generalmente fué que los melocotones más dulces no sabían más dulces sino que sabían mejor; que sabían más a melocotón que los menos dulces. Las fábricas de conservas ya están volviendo al envase todo con azúcar porque están convencidas de que un producto que sepa mejor significará más ventas.

Desde luego, los comentarios de los catadores son muy significantes. Ustedes observaron que dijeron que "los melocotones más dulces sabían más a melocotón." Esto nos llevó a otra interesante investigación. A un

grupo de catadores perfectamente entrenados le dimos a probar mezclas de agua, ácidos de frutas y sabores de fruta sintéticos. Estos expertos pudieron distinguir con absoluta certeza las mezclas más dulces de las más agrias, y cualquier combinación no los engañó. Pero cuando comenzaron a probar combinaciones de dulzura y sabor de frutas, se confudieron. Cuando mantuvimos la dulzura constante, pudieron notar cuando aumentamos el sabor, y cuando mantuvimos el sabor constante y aumentamos el azúcar, pudieron notar que la dulzura había sido aumentada. Sin embargo, también dijeron que habíamos aumentado el sabor. Aquí tenemos un importante problema. El azúcar se nota al disolverse en la boca. La sensación a los sabores está en la lengua y en las paredes de la boca. El sabor de las frutas no se nota quí (a no ser que sea un poco amargo). Las moléculas del sabor tienen que salir de la solución y subir a la nariz para que podamos notarlas. Esto parece una paradoja, puesto que cuando se agrega una substancia a la solución que no puede llegar a la nariz, libera otra substancia de la solución Aquí es donde el acertado razonamiento del Dr. Hass, nuestro presidente, ofrece una explicación. Esta se encuentra en el término teórico del químico físico: fugacidad. El azúcar parece absorber tantas de las moléculas de agua que las últimas no se pueden fijar en el sabor de las frutas. Por lo tanto, el sabor se puede escapar al estado gaseoso y llegar a la nariz. En pocos meses, esta teoría fué probada en el laboratorio, y en la conferencia en septiembre de la Sociadad de Químicos Americanos (American Chemical Association) se presentó un informe al efecto que el azúcar puede causar la fuga del aroma en alimentos hasta 30 por ciento más rápida que en agua. Que los alimentos sepan mejor cuando contienen azúcar, no es un caso fortuito. Los contrarios en esta lucha sufrieron un fuerte revés cuando encontramos que los azúcares de maíz tienen solamente de un tercio a la mitad del efecto sobre la fugacidad que tiene el azúcar corriente. Fué necesario hacer un detenido estudio para probar lo que debiera ser tan evidente: que a la gente le gusta el sabor dulce.

En la industria de bebidas gaseosas, el volumen total de ventas de bebidas endulzadas con alquitrán de hulla fué menos de la centésima parte del aumento en las ventas de bebidas endulzadas con azúcar. Recientemente, un funcionario de uno de los principales fabricantes de bebidas gaseosas me dijo: "No se preocupe; nosotros sabemos que no se puede preparar una bebida satisfactoria con un substituto dulcificante. Nosotros no pensamos usar nada más que azúcar."

Lo anterior demuestra lo que la Fundación ha hecho en su esfuerzo por mantener la posición del azúcar en la industria de alimentos. Estamos convecidos de que este es nuestro mercado principal. Por lo tanto, continuamos con nuestro estudio de otros problemas relacionados con el uso de azúcar en comestibles.

En nuestra búsqueda de usos para el azúcar, no tardamos en reconocer el potencial de la industria de alimentos animales. El plato básico en la mayoría de nuestras comidas es la carne. En Estados Unidos, la carne es principalmente de res, seguida de la carne de cerdo, gallina, cordero, ternera, pavo y pescado. En 1953, el pueblo norteamericano consumió 13.7 millones de toneladas de carne, cuya producción requirió 123.5 millones de toneladas de alimentos concentrados, exclusive de forraje. Para 1975 se anticipa un consumo de carne ascendente a 19.8 millones de toneladas, lo que implicará un consumo de 178.4 millones de toneladas de alimentos animales. Los especialistas de los colegios de concesión de tierras del Departamento de Agricultura de Estados Unidos opinan que para 1975 los alimentos animales corrientes disponibles no pasarán de 165 millones de toneladas. Por lo tanto, será necesario encontrar otros 13 millones de toneladas de alimentos animales a un precio razonable, o el precio de la carne ascenderá enormemente.

En el historial de las ventas de azúcar creemos que tenemos la respuesta a este problema. Desde principios de este siglo, la miel final se viene utilizando cada día más como alimento animal. Hace tiempo que se sabe que 6½ galones de miel final tienen el mismo valor alimenticio animal que un *bushel* (aprox. 35 litros) de maíz. El año pasado, los agricultores en Albany, N. Y. pagaron un promedio de $1.35 por bushel de maíz y 12 centavos por galón de miel final. A este precio del maíz, la miel final valía 21 centavos el galón. Este año, el precio de la miel final en Albany ascendió a 18 centavos. No es extraño, por lo tanto, que en 1955 se consumieron 400 millones de galones de miel final proveniente de azúcar de caña y remolacha para alimento de ganado en Estados Unidos solamente. La fuente de estas mieles es la industria azucarera, de modo que no es posible aumentar la producción de mieles sin aumentar el mercado para el azúcar. Varias compañías azucareras están trabajando en este asunto, pero el ritmo de expansión en la industria azucarera no satisface el aumento en la demanda de mieles finales. Esto explica porqué apenas hay suficiente miel final disponible para satisfacer el mercado actual. Sin embargo, a razón de 18 a 21 centavos por galón de miel final, el ganadero está pagando de 3 a 3½ centavos por libra de azúcar. Varios cubanos me han dicho que Cuba podía producir mieles ricas invertidas o jugo de caña seco al precio de 2 a 2½ centavos la libra. Estos productos se pueden elaborar independientemente del azúcar. De este modo, Cuba podría continuar produciendo azúcar para satisfacer gran parte de la deficiencia de 13 millones de toneladas en la producción de alimentos animales pronosticada para 1975.

Hasta ahora me he estado refiriendo solamente al potencial del mercado de alimentos para ganado, pero no nos detengamos aquí. Un importante mercado potencial para el azúcar, casi por tocar, es la industria de alimentos para aves de corral. En este mercado, las mieles finales jamás podrán anticipar una participación mayor de 1 a 3 por ciento. Por consiguiente, de 30 a 90 mil toneladas o de 5 a 15 millones de galones de miel final serán suficientes para satisfacer este mercado. El Dr. M. M. Rosenberg de la Estación Experimental Agrícola de Hawaii nos dice que una parte importante del alimento de aves de corral podía ser azúcar, con lo cual podrían ser criadas económicamente. Nosotros hemos proseguido con estos estudios y tenemos otros en progreso en la Fundación de Investigaciones Universitarias de Wisconsin. Sabemos que las aves de corral se alimentan perfectamente cuandos sus raciones se componen de una quinta parte de azúcar. También sabemos que cuatro quintos de una ración pueden suplir económicamente toda la proteína, vitaminas y otros elementos minerales que las aves pueden consumir. Ya hemos probado las raciones con jugo de caña seco, mieles ricas invertidas, azúcar crudo y refino granulado. El azúcar en todas estas formas produce los mismos resultados, y las aves se desarrollan perfectamente, por lo que se anticipa que los criadores de aves de corral no encuentren objeción alguna a este alimento.

Estos son los capítulos más interesantes de la historia de la Fundación de Investigaciones Azucareras, lo que demuestra cómo la industria azucarera puede acelerar el desarrollo de mercados para el azúcar. Ahora, sin detenerme a discutir los productos químicos tradicionalmente derivados del azúcar, quiero hablarles de ciertas otras nuevas posibilidades.

Primero tenemos un informe sobre el detergente de azúcar eterizado. A la fecha, la Fundación ha concedido cuatro licencias en el extranjero y tres en Estados Unidos. Hemos sido informados que muy pronto a partir del año en curso, dos fábricas comenzarán a producir este producto en los Estados Unidos. Nuestro interés y esperanzas en esta labor no han disminuído.

Se han solicitado patentes para tres pesticidas que parecen ser muy prometedores: uno es para las ratas, otro para la maleza y el tercero para los aránidos.

Hace como una semana que visitamos el Laboratorio de Investigaciones de Bjorksten en Wisconsin, donde nos entregaron muestras de materiales plásticos de azúcar que se pueden producir por menos de 15 centavos la libra. Estos materiales poseen asombrosas propiedades de resistencia, escaso color y son resistentes al agua. Probablemente estos sean los primeros materiales plásticos satisfactorios derivados del azúcar.

■

Recogiendo la caña en un campo de 84 acres. Al fondo se ven las Montañas Hinchenbrock, próximas a la costa de Queensland.

Informe Sobre la Industria Azucarera Australiana Adelantos en Mecanización y Transporte

Australia ocupa cuarto lugar entre los principales países productores de azúcar en el mundo, superándolo solamente Cuba, la India y el Brasil. Australia produce más de 1,300,000 toneladas cortas de caña al año, cuya producción proviene de unas 9,000 fincas en la región cañera, que se extiende unas 1,300 millas a lo largo del litoral nordoriental del país, bañado por el Océano Pacífico. Por lo general, la región cañera se extiende de 10 a 15 millas desde la costa hacia dentro.

El 97 por ciento de la producción total de azúcar en el país proviene del estado de Queensland, que incluye la mayor parte de las siembras de caña, ascendentes a unos 400,000 acres anuales. La industria azucarera australiana emplea 80,000 personas, por lo menos, directa o indirectamente.

Los australianos no se limitan a producir el azúcar, sino que también lo consumen a razón de 120 libras anuales por persona, como promedio.

Las zonas cañeras en este vasto país (con una extensión aproximada a la de Estados Unidos de América) están sumamente esparcidas. Los expertos en la materia manifiestan que la producción actual podría ser aumentada el 25 al 50 por ciento sin gran aumento en la inversión de capital. Para tal expansión se cuenta con una extensión de tierra casi ilimitada, especialmente si se puede obtener agua de riego.

Actualmente, sólo el 12 al 15 por ciento de las tierras sembradas a caña cuentan con agua de riego, de modo que gran parte de las siembras de caña sólo reciben una lluvia anual de 45 a 50 pulgadas, mientras que en algunas regiones en el lejano norte, la lluvia pasa de 100 pulgadas al año.

Aproximadamente el 50 por ciento de la producción total de azúcar en Australia se consume localmente, y el resto se exporta. Gran parte de este remanente es exportado a regiones comprendidas en el convenio azucarero de la Comunidad Británica de Naciones.

Australia cuenta con 34 fábricas de azúcar crudo, todas ellas en el estado de Queensland, menos tres. Quince fábricas son operadas por cooperativas de productores de caña o colonos.

En Australia no se cultiva la remolacha para la producción de azúcar, no obstante el hecho que el clima al sur del país es ideal para su cultivo. Los primeros esfuerzos encaminados al fomento de la industria azucarera se iniciarion allá por el año de 1896. La última fábrica de azúcar en el estado de Victoria, subvencionada por el gobierno, fué clausurada en 1948 y subsiguientemente desmantelada.

La mayoría de la caña es cultivada por agricultures independientes. La mayor productora de cañas propias es la Fairymead Sugar Company en Bundaberg, cuya producción asciende a unas 150,000 toneladas de caña.

Los trabajos de cultivo en los cañaverales australianos generalmente se realizan con equipo mecánico. No obstante, como la mayoría de agricultores sólo cultivan entre 50 y 60 acres de tierra cada uno, el equipo suele ser de tipo liviano. La excepción se observa en los trabajos de despejo de terrenos, donde se hace necesario equipo pesado.

Las siembras también se hacen mecánicamente en la mayoría de fincas. Los australianos inventaron un ingenioso pequeño aparato que abre el surco, siembra los trozos de semilla (alimentados por un tubo, a mano), y aplica el abono. Este equipo suele ser tirado por un pequeño tractor y es manejado por dos hombres.

Otro aspecto que está recibiendo considerable atención es el equipo de carga mecánico. La carga de la caña es un trabajo difícil y sucio que recibirá atención mucho antes que la recolección mecánica. Ya se encuentran en servicio varias cargadoras de caña livianas, portátiles, provistas de arpeos.

Hasta ahora son pocos los productores que están experimentando con el sistema de recolección mecánica. No obstante, la Fairymead Sugar Company ha progresado muchísimo en este campo, pues está cosechando casi toda su caña con recolectoras mecánicas, las cuales son mayormente de su propio diseño. Además de las máquinas que cortan la caña erecta, ya tienen una máquina para cortar la caña acamada.

El transporte por camión ha progresado poco, salvo para los trabajos de acarreo de los cañaverales a las líneas de ferrocarril de las centrales azucareras o del gobierno en las regiones central y meridional del estado de Queensland. Las empresas azucareras poseen unas 2,000 millas de vías liviana o tipo Decauville; el equipo rodante consta de 200 locomotoras y 33,000 vagones de caña. Además, gran parte de la caña es transportada por ferrocarriles del gobierno.

El escaso progreso alcanzado en la substitución del sistema de acarreo por ferrocarril con camiones probablemente se debe al hecho que los transportes por carretera requieren permiso del gobierno, el cual ha coartado todo esfuerzo por desviar el movimiento de carga sobre sus líneas.

Se encuentran algunos casos aislados donde el acarreo de la caña por camión desde el campo a la fábrica está progresando lentamente. La Maryborough Sugar Company, por ejemplo, transporta aproximadamente el 50 por ciento de sus cañas por camión, lo que probablemente constituye el mayor por ciento de acarreos por camión en la industria azucarera. Por lo general, el movimiento de cañas por camión desde el campo hasta la fábrica no pasa del 5 por ciento de la cosecha total. El 25 por ciento de la cosecha es entregada a puntos de transferencia en líneas de ferrocarril privadas o del gobierno.

Casi la mitad de la cosecha de caña australiana se produce en regiones donde caen escarchas 5 a 50 días al año. Informan que las temperaturas de 31 a 32 grados no afectan la caña de modo alguno más que retardar su crecimiento, la que no muere hasta que la temperatura desciende a 26 o 27 grados por espacio de varias horas. Aún entonces, si la caña contiene jugo, se puede cosechar sin mucha pérdida.

Toda la caña se quema antes del corte. La mayoría de la cosecha se recoge al año de edad. No obstante, en ciertos lugares aislados se cultivan cañas de 24 meses. En 1954, el rendimiento de caña promedio fué de 26 toneladas por acre.

El sistema de distribución y venta del azúcar en Australia es interesante. Toda la producción de azúcar crudo es adquirida por el gobierno del estado por cuenta de la Comunidad o gobierno federal. El gobierno del estado de Queensland nombra una Junta Azucarera, la que a la vez nombra agentes que se ocupan de la refinación y distribución del azúcar.

Durante muchos años, los agentes vienen siendo The Colonial Sugar Reaning Company, Ltd., y la Milliquin Sugar Refining Company. Esta última se ocupa solamente de la refinación de unas 25,000 toneladas de crudos en su propia refinería, cuya producción distribuye en la región de Bundaberg. La Colonial se ocupa de la refinación y distribución del resto de la producción australiana, y de exportar el sobrante al exterior. La Colonial tiene refinerías en Brisbane, Sydney, Melbourne, Adelaida y Perth con una capacidad de unas 550,000 toneladas largas.

La industria azucarera de Australia se está encaminando rápidamente hacia el sistema de manejo de azúcar a granel. Tres pequeñas fábricas de azúcar en Nueva Gales del Sur, propiedad de The Colonial Sugar Refining Company, ya están manejando su azúcar a granel. Una de ellas transporta el azúcar crudo a granel en camiones hasta la refinería de Brisbane, y las otras dos lo embarcan por mar a granel hasta Sydney. En 1957 comenzará a funcionar una planta para el manejo de azúcar a granel en Mackay, con una capacidad anual de 300,000 toneladas y cabida para 150,000 toneladas, la que manejará la producción de siete fábricas de azúcar en esa región.

En 1958 comenzará sus operaciones otro terminal de manejo a granel en Lucinda Point, con una capacidad anual de 140,000 toneladas y cabida para 80,000 toneladas. Para la campaña de 1958 también quedará terminada la instalación de un sistema de manejo a granel en Bundaberg, con una capacidad anual de 80,000 toneladas y cabida para 50,000 toneladas.

Más adelante, Townsville también tendrá un terminal de manejo a granel, para lo cual ya se nombraron los ingenieros constructores, pero no se ha anunciado la fecha cuando quedará terminado. Una organización nombrada por la Junta Azucarera manejará todas estas instalaciones de manejo a granel, las que serán costeadas por dicha Junta. Como se necesitarán unos 200,000 sacos de azúcar para la exportación, no se anticipa que la industria llegue a manejar todo su azúcar a granel en el próximo futuro.

Un adelanto muy singular proyectado para una nueva instalación de manejo a granel en Australia es la instalación de una cámara televisora en el fondo de cada caballete (similar a los empleados en Hilo, Hawaii) para que el operador pueda ver cómo ajustar el arrumador en los trabajos de carga. Otro adelanto es la descarga de azúcar a granel en la refinería Pyrmont de Sidney, donde la Colonial emplea un cucharón de almeja, pero no usa personal alguno en la bodega del buque.

El Central Victoria, propiedad de The Colonial Sugar Refining Company, es la fábrica de azúcar más grande de Australia, con una capacidad de 90,000 toneladas cortas. El Central Inkerman ocupa segundo lugar, con 60,000 toneladas de capacidad. Incidentalmente, el Central Inkerman muele solamente cañas cultivadas en regiones regadas.

Recolectora de caña a dos sucros montada en un tractor de 30 c.f. al servicio de la Fairymead Sugar Co., Ltd.

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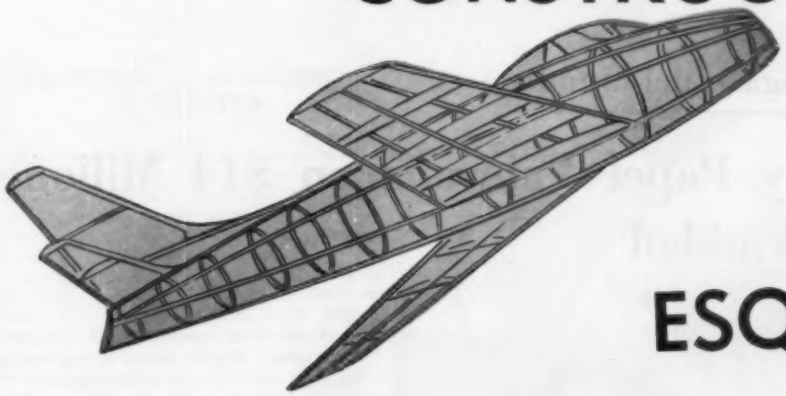
WILMINGTON 99, DELAWARE, E. U. A.

CONSTRUCCION DEL ESQUELETO

SECCION 20



"La Resistencia Está en la Armazón"

SECADORAS DE AZUCAR por SQUIER

Así como en la construcción cabal de aviones, buques o puentes, la *armazón* se hace sumamente resistente, la SQUIER aplica este importante principio a la construcción de secadoras de azúcar.

La ilustración arriba muestra la construcción del esqueleto de una Secadora SQUIER Giratoria. Obsérvense los robustos travesaños cóncavos que facilitan el movimiento giratorio y le imparten rigidez a la estructura del tambor. El "casco" de este fuerte esqueleto traba toda la armazón y la hace todavía más resistente.

Esta resistencia se refleja en muchos años de servicio y en la ausencia de dificultades . . . cuando usted insiste en uno de los múltiples tipos de Secadoras SQUIER para cualquier trabajo de secado. Solicite más información hoy mismo.

"Desde La Caña Hasta El Saco De Azucar" . . . . . .

SQUIER

THE SQUIER CORP.

INGENIEROS Y FABRICANTES

BUFFALO, NEW YORK, E.U.A.

La Mayor Papelera de Bagazo del Mundo

Fábrica de Pasta y Papel Valorada en $14 Millones para el Central Trinidad

"El significado del proyecto de la nueva Papelera Pulpa Cuba, S. A. yace en el hecho que animará a otras regiones productoras de azúcar a explotar el bagazo como materia prima para la producción de pasta y papel, y satisfacer así las necesidades de fibra en perspectiva," dijo el Dr. Joseph E. Atchison, vicepresidente de la Parsons & Whittemore, Inc., durante su plática en Nueva York a fines de diciembre de 1956.

El proyecto aludido: una fábrica completamente integrada de pasta y papel de bagazo blanqueados valorada en 14 millones de dólares que se establecerá en el puerto de Trinidad en la costa meridional de Cuba.

La ocasión: conclusión de contratos en Nueva York entre la Papelera Pulpa Cuba, S. A. y la Parsons & Whittmore, Inc., conforme a los cuales la P & W suplirá el equipo para la nueva planta.

La nueva fábrica de pasta de bagazo será la más grande y más moderna del mundo en su clase cuando quede terminada dentro de 16 meses. Tendrá una capacidad de 100 toneladas diarias de pasta y papel blanqueados y por blanquear. Esta instalación situada próxima al Central Trinidad, una fábrica de azúcar crudo de 3,000 toneladas de capacidad diarias operada por los mismos intereses que rigen la Papelera Pulpa Cuba, S. A., será la primera en el mundo donde todos los componentes, incluso la propia máquina de hacer el papel, serán diseñados exclusivamente para manejar bagazo.

La situación de la fábrica de pasta y papel se presta idealmente para satisfacer sus necesidades de bagazo, ya que las facilidades en el lugar de la fábrica incluyen un excelente sistema de transporte para traer un amplio acopio de bagazo de todos los centrales azucareros adyacentes, además de toda la producción de bagazo del Central Trinidad, cuyo último será convertido para quemar petróleo. El Sr. Jesús Azqueta, presidente de la nueva empresa, está convencido de que para tener éxito, una fábrica de pasta de bagazo no puede depender del bagazo sobrante de fábricas de azúcar crudo, sino que debe contar con toda la producción de bagazo de un central que haya sido convertido para quemar gas o petróleo. Esto podrá ser complementado con la compra de bagazo sobrante según se necesite; pero el suministro básico está asegurado de un solo central.

La producción incluirá papel blanqueado y tabla de muchos tipos, así como una variedad de papeles por blanquear, cartón corrugado y cartón para cajas. Se espera que la producción de la nueva fábrica, aunida a la de las fábricas de papel ya existentes en la Isla, satisfaga plenamente el mercado de Cuba en todos los grados de papel y cartón, con excepción de papel de periódico y cierto papel de calidad muy especial. El papel de periódico para satisfacer las necesidades de la prensa cubana será fabricado por una fábrica nueva en vías de construcción en Cárdenas, Cuba, que usará el proceso de Joaquín de la Roza.

El Dr. Joseph E. Atchison, vice presidente de la Parsons & Whittemore, constructores de la nueva fábrica de pasta y papel de bagazo de 100 toneladas de capacidad diarias. En posesión de gran experiencia en este ramo, el Dr. Atchison se ocupó de las negociaciones principales de parte de la P & W y ayudó a resolver los problemas técnicos más importantes.

Este proyecto se espera que sea el precursor en el desarrollo de una importante industria en Cuba partiendo del bagazo, el cual se usa ahora solamente como combustible en las calderas de los centrales azucareros. La pasta de alta calidad resultante será vendida en los mercados del mundo como pasta de liga especial, aprovechando así sus características especiales en gran variedad de grados de papel.

La Papelera Pulpa Cuba, S. A., que está emprendiendo el nuevo proyecto es en sí una empresa nueva, cuyos propietarios principales son importantes industrialistas en Cuba.

El Sr. Jesús Azqueta, presidente de la empresa, opera tres centrales azucareros en Cuba y un gran central azucarero en Venezuela. Por lo tanto, la materia prima para la nueva planta está asegurada.

El Sr. Rafael Palacios, tesorero de la nueva compañía, ha tenido mucho éxito en varias empresas industriales en la economía cubana en rápido desenvolvimiento, mientras que el Sr. G. Castro, vicepresidente, tiene parte en dos centrales azucareros y en una de las fábricas de papel ya existentes en Cuba.

Los principales funcionarios de la Papelera Pulpa Cuba, S. A. están singularmente preparados para esta empresa, pues cuentan con gran experiencia tanto en la industria papelera como azucarera, así como plenos conocimientos sobre las finanzas y operación de empresas. Los ingenieros de la Papelera han estado trabajando conjuntamente con los de la P & W sobre el diseño de la fábrica de papel que se está acercando a la etapa final.

Un miembro del cuerpo ejecutivo de la Papelera es el Sr. Y. T. Kao, uno de los expertos más destacado en el mundo en pasta de bagazo. Anteriormente, el Sr. Kao fué gerente de la fábrica de papel en Hsinying, Formosa, durante más de diez años. Esta fábrica usaba bagazo en gran escala, pues tiene una capacidad de 80 toneladas diarias de pasta blanqueada. Es obvio que el Sr. Kao desempeñará un importante papel en el diseño y operación de la fábrica de papel en Trinidad, Cuba.

Ahora ya se puede colocar el pedido para la maquinaria necesaria; en efecto, la máquina de papel ya fué pedida a la Black-Clawson Company, filial de Parsons & Whittemore. La P & W está operando mundialmente en el desarrollo de fábricas de pasta y papel, utilizando las cosechas anuales disponibles localmente. Su experiencia se extiende a Europa, México, África del Norte, Portugal y América del Sur. De momento están trabajando en una fábrica de pasta y papel a base de bagazo en Colombia. El Dr. Atchison, quien representó a la Parsons & Whittemore en las negociaciones con la Papelera Pulpa Cuba, cuenta con extensa experiencia en este ramo, pues ha sido jefe de la Sección de Pastas y Papeles de la Administración de Cooperación Económica, entre otros cargos. Actualmente, además de su trabajo con la Parsons & Whittemore, es miembro de un grupo de expertos que está estudiando la utilización de residuos agrícolas para la Comisión Presidencial para la Mayor Utilización Industrial de Productos Agrícolas.

FILOLOGIA y AUXILIARES FILTRANTES

Joseph Conrad habla de las palabras "desprestigiadas por el uso incorrecto a través de los siglos," y si consultamos un buen diccionario vemos, en efecto, que muchas palabras de uso diario ya no tienen un significado perfectamente determinado. Esto es precisamente lo que ocurre en el ramo de la filtración, donde muchas personas confunden la calidad con el grado de un auxiliar filtrante. Esta confusión probablemente se complica todavía más por la práctica de la industria de materiales diatomáceos de darle cierto nombre a sus distintos auxiliares filtrantes, en vez de darles una designación sencilla y directa según el grado.

Pero tal vez sea mejor que hablemos de la eficiencia de los auxiliares filtrantes—su hablidad de producir máximos rendimientos y la claridad correspondiente con dosis mínimas. Esta alta eficiencia es esencial para la calidad del producto y para mantener los costos de operación a un nivel razonable. Se encuentran muchos casos donde la curva de producción de una planta depende del rendimiento de la estación de filtros. Y esta alta eficiencia es una función tanto de la calidad como del grado.

En auxiliares filtrantes de diatomita, la calidad y el grado no son la misma cosa. Todos los principales productores de auxiliares filtrantes tienen disponible una serie de grados, desde partículas finas hasta partículas gruesas, con los cuales el régimen de flujo y la claridad disminuyen según aumenta el tamaño de las partículas. Esta diversidad de grados permite emplear un auxiliar filtrante conforme a las características del licor a filtrar.

No obstante, los auxiliares filtrantes de distintos fabricantes pueden ser equivalentes en grado, pero muy diferentes en calidad y eficiencia. El material de calidad inferior puede producir tan buen régimen de flujo como el de calidad superior, pero ser inferior en claridad. O, la claridad puede ser lograda a costas del régimen de flujo. Sin embargo, el defecto más común de auxiliares filtrantes de calidad inferior es su inhabilidad de manejar los licores de difícil clarificación que ocasionalmente se encuentran en casi todas las plantas.

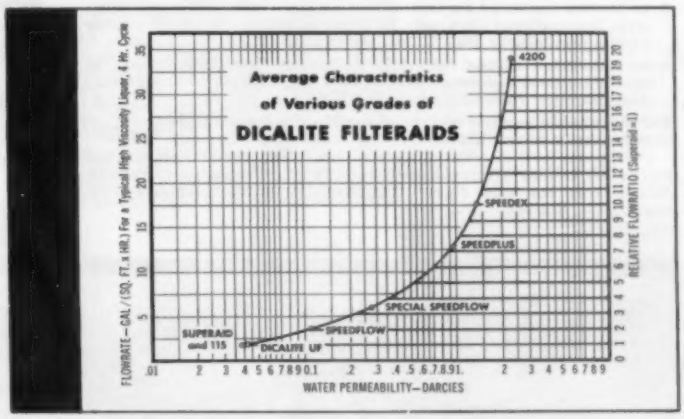
Esta propiedad—la habilidad de manejar licores difíciles con dosis económicamente razonables—es la verdadera prueba de un auxiliar filtrante de calidad superior. Esta característica no se le imparte a un auxiliar filtrante accidentalmente, pues para poner en práctica la información básica referente a la distribución del tamaño de las partículas y otras características necesarias en un auxiliar filtrante de buena calidad, se requiere un trabajo experimental cabal basado en años de experiencia en filtración. Y para que estos conocimientos tenga valor, la producción de auxiliares filtrantes de calidad tiene que estar respaldada por el dominio de reservas de materia prima de alta calidad y el equipo de trituración y clasificación que permita elaborar esta materia de acuerdo con los estrechos límites impuestos por un riguroso sistema de regulación de la calidad. Hasta ahora, este es el único método conocido de asegurar óptima calidad en auxiliares filtrantes de diatomita.

P. W. Leppla
Director Técnico

... pero una sola calidad!

Los auxiliares filtrantes y ciertas frutas tienen una cosa en común—el grado o tamaño—que no tiene nada que ver con la calidad. La fruta más pequeña puede igualar a la más grande en todo menos en tamaño.

La calidad en un auxiliar de filtración significa el máximo valor clarificante posible para el grado usado, con el mayor rendimiento por cantidad de material filtrante. Dicalite posee esta alta calidad en todos los grados, gracias a (1) la esmerada selección de la diatomita extraída de cuatro excelentes yacimientos de Dicalite; (2) su elaboración con el equipo más moderno disponible; y (3) la regulación de la calidad por el sistema más estricto en el ramo, lo cual asegura la misma graduación y distribución del tamaño de las partículas en todos los grados, todo cuidadosamente regulado uniformemente y con certeza. Esto explica porqué tantas firmas importantes en todas las industrias de elaboración han adoptado los auxiliares filtrantes Dicalite con norma.



¡Dicalite Tiene Siete Grados De Auxiliares Filtrantes ... Pero Una Sola Calidad—La Mejor!

Para información más completa, escriba a:

Dependable GLC GREAT LAKES **Dicalite** DIATOMACEOUS MATERIALS

dicalite division, great lakes carbon corporation 612 south flower st., los angeles, california

Camiones de Línea-S International

INTERNATIONAL HARVESTER

Modelo S-180 con carrocería de estacas, PBV de *19,000* lbs.

4 RAZONES POR LAS CUALES INTERNATIONAL SE IMPONE EN LAS GRANJAS!

Si usted *nunca* ha tenido un camión International, hable con un agricultor que posea uno. Averigüe por qué los agricultores que saben de camiones escogen el International y *nunca cambian* de marca.

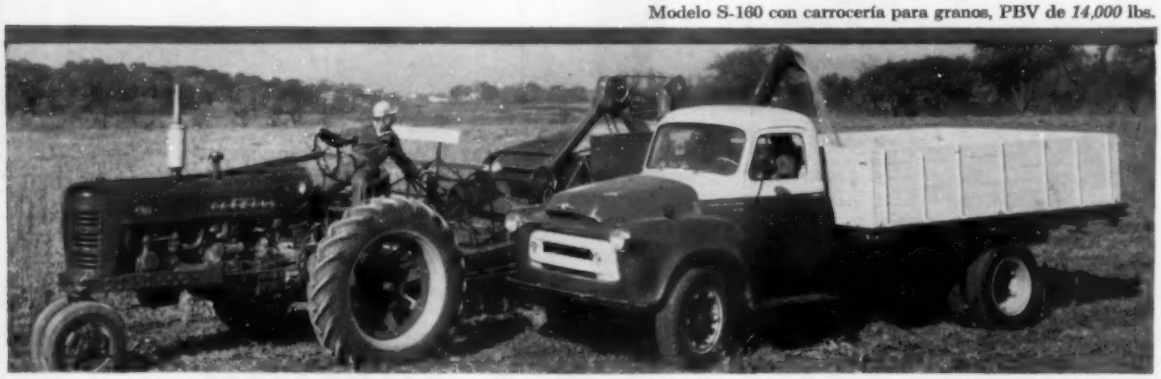
1. **La potencia es una razón!** Dispone Ud. de más fuerza útil a rpm menores. Los camiones de su granja duran más, su operación cuesta menos.
2. **El rendimiento es una razón!** Un International se construye totalmente como camión, sin ningún componente de automóvil. Dispone usted de un servicio apto y confiable para cada tarea en la granja.
3. **La amplia variedad de carrocerías es una razón!** Hay una carrocería International para cada tarea en la granja—todas ellas construidas para resistir años de verdadero maltrato.
4. **La comodidad es una razón!** Todos los camiones International se diseñan teniendo en mente al conductor. Se manejan con más facilidad y rapidez, rinden más trabajo.

International le permite escoger el camión que necesita, de estas tres grandes líneas . . . las Líneas S y R de 6 cilindros y la Línea V-8.

Pídale una demostración al distribuidor International o solicite por escrito un catálogo, especificando el PBV y el estilo de carrocería. International Harvester Export Company, 180 N. Michigan Ave., Chicago 1, Ill., E. U. A.

Modelo S-110 con carrocería de reparto, PBV de *4,200* lbs.

Modelo S-160 con carrocería para granos, PBV de *14,000* lbs.



¿Qué hay nuevo en equipo azucarero? . . .

Vea a la Industrial

Todas estas unidades es lo más moderno en su clase . . . con distintivos exclusivos para ayudarle a mejorar la calidad del azucar o ahorrar materiales costosos. Cuando usted se disponga a ensanchar o hacer adiciones a su aparato de procesar—vea a la Industrial . . . y encontrará que se ha agregado algo nuevo.

FILTROS HORIZONTALES

Estos filtros ofrecen muchos distintivos para elevar la eficiencia en trabajos de filtración. Su puerta de apertura rápida, accionada hidráulicamente, y su conjunto de hojas a plena vista, facilitan su inspección y limpieza. Construídos conforme a las normas de la ASME, con mecanismos de limpieza automáticos: por aire, por agua o sacudimiento.

Pida el Boletín NH-155

FILTROS VERTICALES

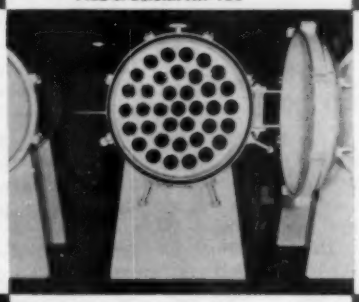
Construídos conforme a las normas de la ASME en gran diversidad de materiales y tamaños. Disponible con distintivos muy convenientes, como: cámaras de apertura por el fondo, tapas de apertura rápida, cuerpos enchaquetados, y mecanismos de limpieza rápida que economizan tiempo: por aire, por agua o por sacudidores mecánicos.

Pida el Boletín 100

FILTROS TUBULARES

Nuevas conveniencias de funcionamiento para trabajos de filtración en pequeña escala. Ideal para afinar líquidos, como filtro de seguridad y como barrendero para filtros mayores a un costo menor que el de placas de barrido. El sistema de fluje de "dentro hacia fuera" de este filtro, y el empleo de forros de papel filtrante corriente, facilitan su operación en alto grado.

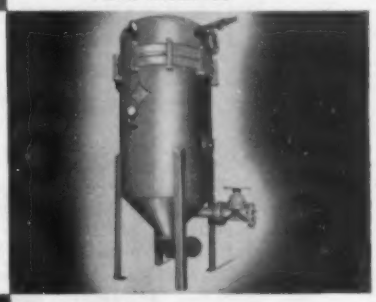
Boletín 75-160-735

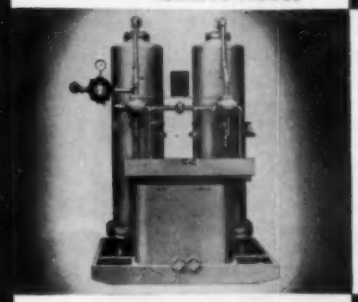


FILTROS "HYDRA-SHOC"

Se limpian ellos mismos en segundos sin bombas a contracorriente ni agua filtrada. El filtro "Hydra-Shoc" es de tipo tubular con camisas desgastables de tejido sintético duro. Su sistema excepcional autogene rador de presión produce un reflujo que expande o dilata las camisas instantáneamente, desaloja y expulsa la torta del filtro.

Boletín 114

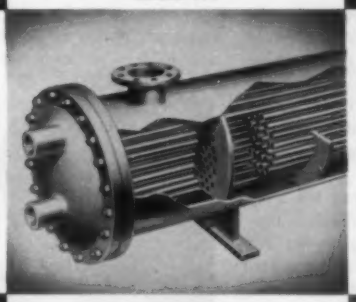




PERMUTADORES IÓNICOS

Con los costos de operación calculados en centavos por mil galones, los permutadores iónicos "Industrial" son especialmente construídos para la depuración de agua, tratamiento de despojos, recuperación de metales, y para el tratamiento de otros soluciones.

Boletín 2000-SM



PERMUTADORES TERMICOS

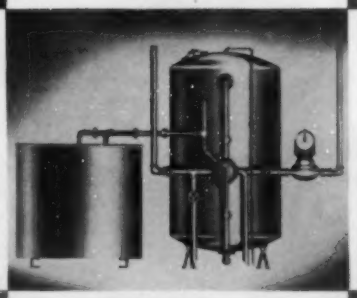
Para líquidos y gases corrosivos y no corrosivos. La Industrial construye estos permutadores térmicos de acuerdo con el servicio que han de prestar, y puede suministrar las bombas, tubería, accesorios, y demás auxiliares que se necesiten.

Boletín 600-2-354

SUAVIZADORES DE AGUA

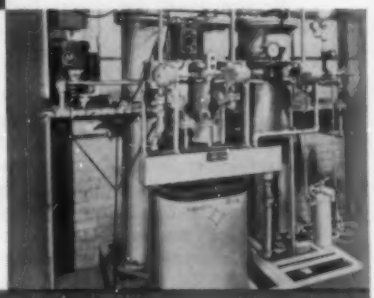
Suavizadores de agua en una sola pasada u operación a base de ceolita. Completamente automáticos, semiautomáticos o de regulación manual.

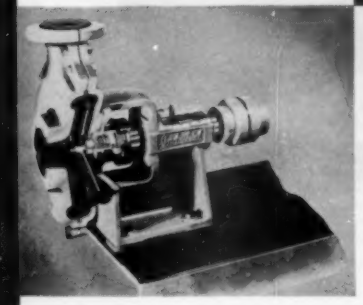
Boletín 211



TRATAMIENTO DE DESPOJOS

Para la recuperación o destrucción de despojos químicos. Muchos sistemas "Industrial" de recuperación han reembolsado su costo en pocos meses. Servicio completo, desde el análisis de la solución a tratar hasta la instalación del equipo.





BOMBAS CENTRÍFUGAS

Bombas especialmente diseñadas con camisas o forros de caucho para resistir la corrosión y abrasión. Solamente un corte seccional de este modelo puede ilustrar los distintivos que se traducen en larga duración y bajo costo de conservación.

Boletín 300

CENTRIFUGAL PUMPS · PRESSURE FILTERS · ION AND HEAT EXCHANGERS · RUBBER LININGS · WASTE TREATING EQUIPMENT

Industrial

INDUSTRIAL

FILTER & PUMP MFG. CO.

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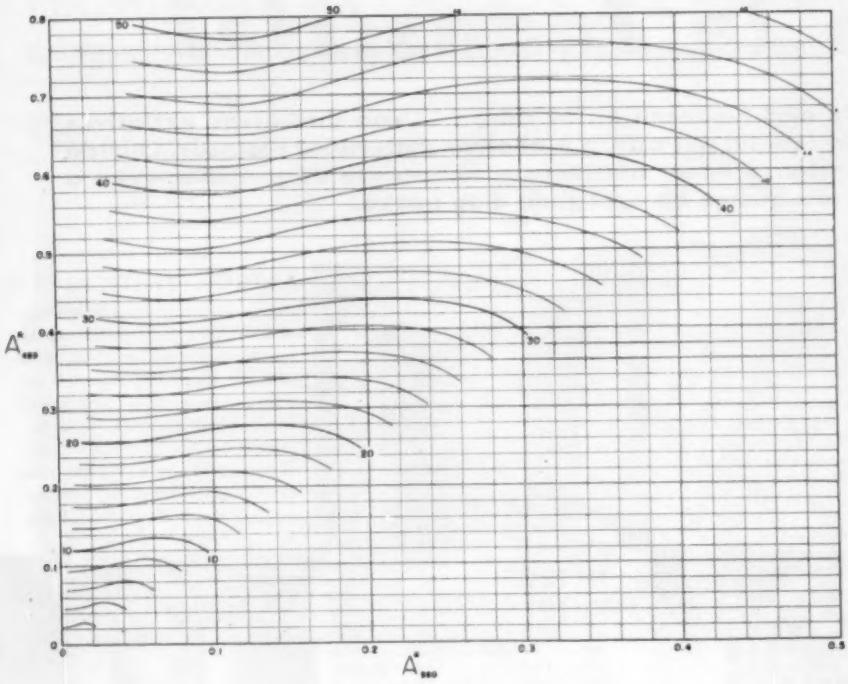
Escala de Color para Azúcar



La determinación exacta del color es de gran importancia práctica en la industria azucarera. Desde principios del Siglo XIX se ha usado el cálculo de color para evaluar los productos de azúcar líquido; para descubrir los cambios que ocurren durante el proceso de elaboracion; y para evalue los adsorbentes para la remoción de color en el azúcar. No obstante, en la medición de color en la industria azucarera siempre se han encontrado dificultades por la falta de normas de color del azúcar y una unidad de color apropiada. Durante los últimos 50 años se han propuesto muchos materiales para este fin, pero ninguno ha resultado ser satisfactorio en todos sentidos.

Recientemente fué desarrollada una unidad fundamental de color para el azúcar en el Negociado Nacional de Normas por miembros del Bone Char Research Project, Inc. (Proyecto de Estudios de Carbón de Hueso)—un cuerpo de investigadores mantenido en el Negociado por fabricantes de azúcar y de carbón de hueso para la refinación de azúcar. Esta unidad de color se ha usado con buenos resultados, conjuntamente con su escala de color, para caracterizar varios tipos de soluciones de azúcar.

La escala NBS (National Bureau of Standards o Negociado Nacional de Normas) se obtiene usando una fórmula empírica para evaluar la diferencia perceptible entre el color de un azúcar comercial y una solución de sacarosa incolora sumamente purificada. Esta escala permite usar un solo número para representar la apariencia visual. De modo que pone al alcance de la industria azucarera la caracterización de color más sencilla posible, y coloca la medición en una base relativa como la que se usa en la industria.

En la práctica, le color de una solución de azúcar en unidades NBS se obtiene de un gráfico sencillo sin cálculo alguno, una vez que se conoce la transmitencia de la solución a dos longitudes de onda, 420 y 560 milimicrones. Esto se hace posible por la sencillez inherente de los colores de azúcar, como lo demuestran las curvas de transmitencia espectrofotométricas para soluciones de azúcar, contra longitudes de onda. En estas curvas, la transmitencia siempre aumenta con la longitud de onda, y se encuentra que existe una simple relación algebraica entre la transmitencia y la longitud de onda. Esta relación hace posible trazar una curva espectrofotométrica para cierta solución totalmente de las observaciones de transmitencia a dos longitudes de onda solamente.

El gráfico de color consta de una serie de curvas, cada una representando cierto valor de color de azúcar en unidades NBS. Los dos ejes de las curvas están graduados en términos de atenuancia* (recíproco de transmitencia) de una solución de azúcar a 420 y 560 mu, respectivamente. De modo que cualesquier dos valores de transmitencia a dos longitudes de onda determinan un punto en el gráfico. Si el punto coincide con una de las curvas, su valor en unidades de color del azúcar se obtiene de esa curva; y si no, se determina por interpolación.

(Sigue en la página 72)

Arriba. *En el Negociado Nacional de Normas, las soluciones de azúcar se echan en un espectrofotómetro para medir la transmitencia.* Abajo. *Después de medir los valores de atenuancia a 420 y 560 milimicrones, el valor del color se encuentra como un punto en el gráfico que tiene los dos valores de atenuancia como coordenadas.*

Más adelantos Westinghouse para la industria

EL NUEVO CONTROL "AUTOMATION" NO TIENE PIEZAS MOVILES

Ahora, en pequeñas unidades de enchufe y cuyo tamaño no es mayor que el de una cajetilla de cigarrillos, ¡hay controles automáticos que gobiernan el funcionamiento de una máquina, una cadena de montaje o toda una fábrica! Estos dispositivos, llamados "Cypak", reciben órdenes y las ejecutan, tienen memoria y deciden pos sí mismos. Tienen años de adelanto sobre los relevadores convencionales y no emplean piezas móviles . . . ninguno de sus componentes puede desgastarse, corroerse o causar un paro en la producción. Sus posibles aplicaciones inmediatas se cuentan por centenares . . . en las refinerías de petróleo, las fábricas de tejidos, las minas y las fábricas de toda clase. Si desea más información, solicite el folleto "A".

Para obtener información sobre los adelantos aquí mencionados, o si desea ayuda en sus problemas específicos de ingeniería, escriba a Westinghouse Electric International Co., 40 Wall Street, Nueva York 5, E.U.A.

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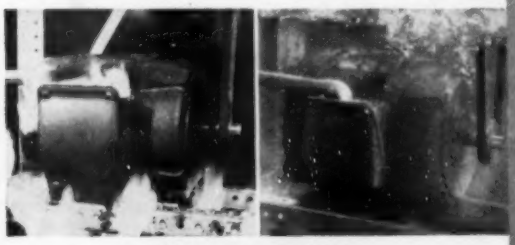

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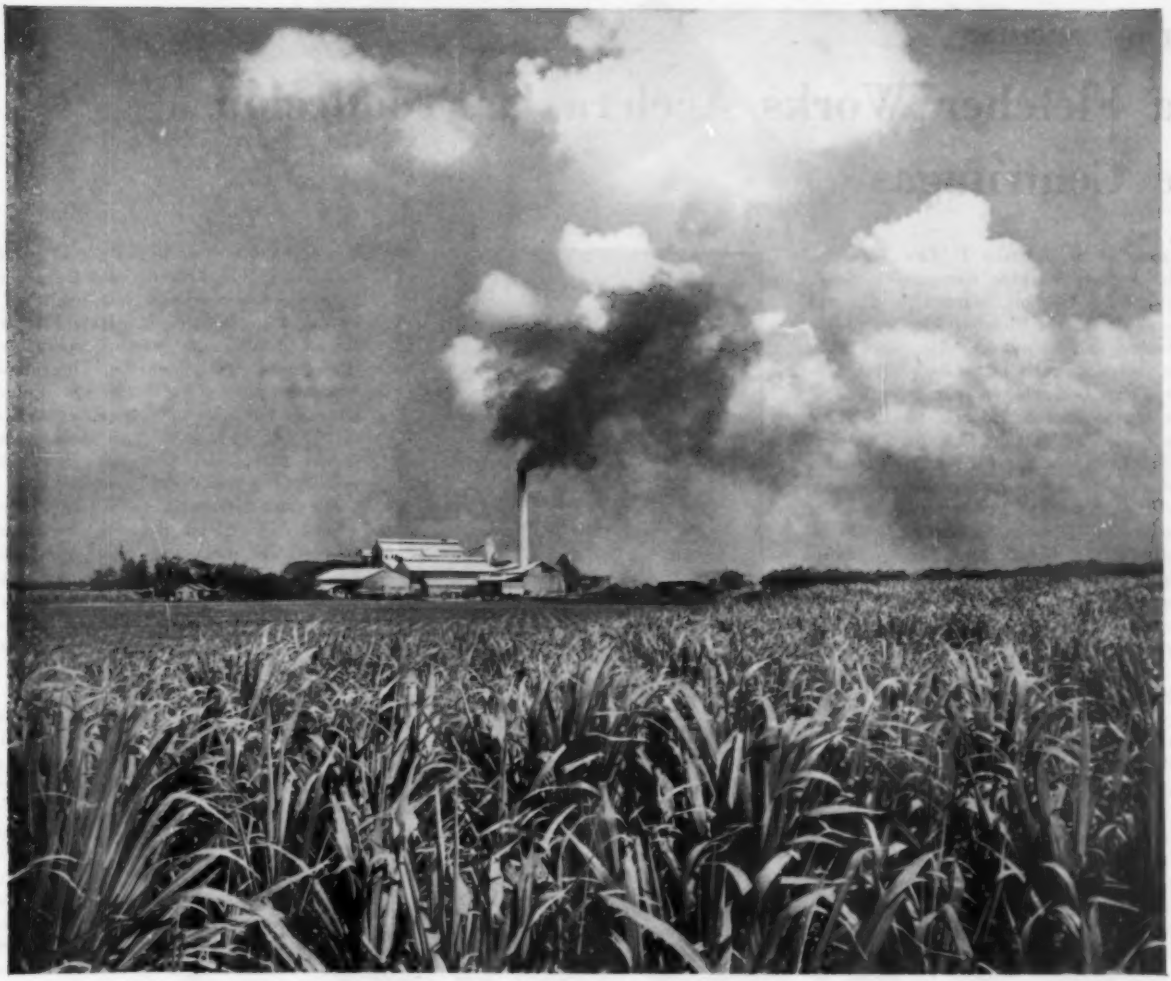

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Firma Secular

La Fletcher Works Acelera la Producción de Centrífugas

Cuando el Sr. Edward T. Taws, director de la Brinton Machine Company y de la Pennsylvania Ribbon Manufacturers, oyó rumores de que la Fletcher Works, situada en Second and Glenwood Avenues en Filadelfia, se encontraba en una situación económica muy precaria, en seguida se dirigió a las oficinas del Sr. Morris Chatlin, propietario de la Fletcher. La preocupación del Sr. Taws era natural, en vista de los pedidos de telares para tejidos angostos y centrífugas que la Pennsylvania Ribbon Manufacturers tenía colocados con la Fletcher. El Sr. Chatlin, un próspero fabricante de dulces y confites de Brooklyn, había adquirido la firma centenaria en 1955. Como resultado de esta entrevista, se acordó la venta de la Fletcher Works, E.U.A., al Sr. Taws, y el trato se cerró el 13 de enero de 1956, exactamente veinticuatro horas después de la visita del Sr. Taws para enterarse del futuro de la Fletcher Works.

Con el futuro de la Fletcher en manos del dinámico Sr. Taws, se registró un desenvolvimiento de interés para la industria azucarera. Como los jefes de la industria azucarera saben, esta empresa ha mantenido un estrecho vínculo con esa industria. Se cree que la Fletcher, en un tiempo conocida como la firma de Uhlinger & Schaumn, fué la primera en iniciar la construcción de centrífugas en los Estados Unidos. En efecto, uno de sus primeros modelos construído durante la Guerra Civil norteamericana todavía se puede ver en los salones de exhibiciones de la empresa.

Los directores de la Fletcher se complacen en exhibir esta vieja centrífuga porque ello demuestra la larga experiencia de la empresa en este ramo y ofrece un marcado contraste con los tipos de centrífugas modernas completamente automáticas.

El interior de la planta de la Fletcher tiene más de 200,000 pies cuadrados de espacio. La prolongación de la planta ocupa varias cuadras o manzanas, pero las facilidades fabriles están dispuestas de tal modo que los diversos departamentos son independientes, y no obstante, la producción fluye en línea recta.

Durante los últimos doce meses, el Sr. Taws invirtió algo más de $250,000 en la modernización del equipo y líneas de producción. Este programa es continuo, porque la demanda de centrífugas Fletcher es tal que la producción tiene que ser acelerada sin sacrificar la calidad.

No sólo la disposición de la planta ha

Sr. E. T. Taws

sido completamente transformada en un conjunto moderno, sino que la organización y normas comerciales han sido modificadas para ofrecer a sus clientes una sección de ventas y servicio integral. Una notable innovación en el programa del Sr. Taws es su plan de ventas de centrífugas.

"Nosotros venderemos estas máquinas del mismo modo que se venden automóviles, dice el Sr. Taws. "Las exhibiremos, dejaremos que los clientes vean cómo funcionan, y luego proporcionaremos un servicio completo y rápido y las piezas de repuesto que se necesiten."

Para facilitar estas demostraciones se alistó una sala de exhibiciones para la división de centrífugas frente al taller de centrífugas y sección de montaje. Los visitantes pueden operar cualquiera de los numerosos modelos de centrífugas en el salón de exhibiciones de 1.200 pies cuadrados.

Adyacente al amplio y lujoso salón de exhibiciones está otro importante departamento—el Laboratorio Fletcher de Investigaciones y Ensayos. Este laboratorio presta un servicio gratuito a cualquiera que desee probar algún material.

Los interesados pueden enviar muestras de materiales al laboratorio Fletcher para su análisis gratuito, después del cual los químicos y técnicos de Fletcher rinden un informe y ofrecen recomendaciones. Cualquier representante autorizado de la industria azucarera puede usar una centrífuga experimental en el laboratorio.

Otra sección auxiliar es el servicio de consultas disponible veinticuatro horas al día en cualquier parte del país. Despues de estudiar la industria de centrífugas, el Sr. Taws reconoció que si una máquina falla en un punto lejos de la planta Fletcher, el dueño difícilmente puede esperar varios días hasta que llegue un ingeniero de Fletcher por avión. Por lo tanto, la empresa tiene un cuerpo de técnicos especialmente preparados establecidos en diversas partes del país para responder a consultas gratuita e inmediatamente.

Otra importante innovación de la nueva gerencia de Fletcher es un departamento especial de piezas de repuesto, donde se encuentran más de 150,000 piezas correctamente clasificadas y almacenadas hasta 10 pies de alto. Este departamento solamente, ocupa unos 25,000 pies cuadrados dentro de la planta.

"No queremos que nadie tenga que sus pender sus operaciones fabriles espera de una piezs," explico el Sr. Taws. "Esta es la razón porqué la rápida reposición de piezas vino a ser uno de nuestros principales objetivos."

En la línea de montaje, el departamento de ingeniería ha establecido puntos de comprobación en cada etapa de producción. Las piezas se examinan continuamente para determinar cualquier falla. Después de que todas las piezas móviles y accesorios son examinados, se efectúa un ensayo del funcionamiento mecánico previo al embarque.

El Sr. Taws considera esta regulación de la calidad una economía importante porque ello ofrece una garantía contra dificultades en servicio. Además, crea buenas relaciones públicas, según dice el presidente de la Fletcher, "porque un cliente que recibe una máquina en perfectas condiciones funcionales comprará más en el futuro."

Además de centrífugas para la industria azucarera, la Fletcher construye otros tipos para la industria química, lavanderías y tintorerías o talleres de limpieza en seco. Recientemente se terminó la construcción de una batería de centrífugas para la Comisión de Energía Atómica (Atomic Energy Commission).

"Nosotros siempre estamos procurando hacer mejoras, elevar la eficiencia funcional y desarrollar nuevo equipo," declaró el Sr. Taws, y para este fin tiene establecida una Sección de Investigaciones y Desarrollo. Uno de sus logros recientes es la centrífuga colgante completamente automática que sólo requiere un ajuste, poner en contacto un botón de arranque—y la máquina realiza el mismo ciclo repetidas veces sin necesidad de ajuste manual.

Una respuesta a las preocupaciones de los refinadores!

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Extractos de Publicaciones Azucareras

Publicados bajo los Auspicios de la Sociedad Internacional de Tecnólogos Azucareros de Caña—Dr. O. W. Willcox, Redactor Técnico

Comisión Internacional Sobre Métodos Uniformes de Análisis Azucarero

Memoria, 11ª Sesión (París, 1954); 113 páginas 8½" x 10½". Distribuída por el Dr. H. B. Hass, Sugar Research Foundation, Inc., New York 5, N. Y., E. U. A.

Este trabajo incluye informes, discusiones y conclusiones sobre casi todas las especificaciones y ensayos de materiales relacionados con la evaluación de productos de azúcar.
ington en 1958.

La próxima sesión de esta comisión se celebrerará en Washington en 1958.

Proceso de Sulfocarbonatación

R. S. DUBEY y S. S. MAVI, *9° Congreso*, Sociedad Internacional de Tecnólogos en caña de Azúcar, Trabajo No. S.M. 1, India.

La industria azucarera de la India siempre se encuentra ante el problema de la escasez de piedra calcárea de buena calidad y a un precio razonable, por lo que se está haciendo un gran esfuerzo por desarrollar procesos de elaboración que requieran menos cantidad de cal. Dubey y Mavi concibieron un nuevo método, por el que se procede como sigue:

El jugo mixto se calienta a unos 55° C. y se trata con lechada de cal de 18° Baumé al 1% por volumen, y luego con dióxido de azufre hasta un pH alrededor de 7.0. Luego se alcaliza y carbonata nuevamente, usando lechada de cal al 2-4% por volumen. El jugo de la primera carbonatación se filtrado pasa por la segunda carbonatación, filtración y sulfatación hasta neutralizarlo, tal como en el proceso de carbonatación corriente. La cantidad total de lechada de cal de 18° Baumé que se necesita es 5% por volumen, lo que representa aproximadamente la mitad de la que se consume en el proceso corriente de carbonatación, no obstante lo cual se obtiene un aumento comparable en pureza; aun cuando la cantidad de lechada de cal se reduce a 3% por volumen, los resultados son escasamente inferiores. En todo caso, el volumen de torta es menor. La dureza y ceniza total en el jugo clarificado, en este proceso, exceden un poco las que se obtienen en el proceso corriente, pero entonces la relación de glucosa/ceniza es mayor, debido a la menor destrucción de azúcares reductores por la menor cantidad de cal; por consiguiente, no se menoscaba el agotamiento de las mieles finales.

Una importante ventaja del nuevo proceso es sin duda alguna la filtración más rápida. Los cristales en las tortas obtenidas por el proceso de carbonatación ordinario forman diminutas barras rectangulares libres, mientras que en el nuevo proceso estas barras se ven agrupadas en aglomeraciones irregulares que naturalmente forman numerosas cavidades, las que facilitan el paso libre del líquido y retención de los coloides en suspensión, y dan por resultado un filtrado más brillante. Este efecto en la torta se atribuye al precipitado de sulfito de calcio producido por el dióxido de azufre. El nuevo proceso se está perfeccionando más aún.

■

Remoción de la Materia en Suspensión en Jugos de Caña a la Clarificación

JOHN H. PAYNE y GEORGE E. SLOANE, *9° Congreso*, Sociedade Internacional de Tecnólogos en Caña de Azúcar, India (1956).

En regiones donde la caña de azúcar es recogida mecánicamente, los jugos suelen contener fuertes cantidades de sólidos insolubles, especialmente cuando la recolección se hace en tiempo lluvioso, dándose algunos casos donde tales sólidos ascienden a 6 y 7%. Éstos traen como resultado el desgaste de tuberías y bombas, y propenden a asentarse en el fondo de los tanques, donde crean un ambiente propicio para el desarrollo de microorganismos.

Entre los diversos medios de remover esta materia terrosa se encuentran los coladores de jugo, que separan el bagacillo pero no la arena fina. Las centrífugas de taza (separadores de lechada) son eficaces para la remoción de sólidos de todos tamaños, pero su baja capacidad y alto costo de la mano de obra hacen su uso prohibitivo; además, se desgastan rápidamente. También se usan diversos tipos de separadores para remover la arena, pero las partículas finas continúan presentando un problema en las estacionas de filtración. Los separadores ciclónicos ordinarios ayudan a resolver el problema, pero no eliminan las partículas finas.

R. T. Webb, de la Olokele Sugar Company en Hawaii, inventó

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un nuevo tipo de separador ciclónico, el cual se basa en el principio que la fuerza separadora en un ciclón es inversamente proporcional al radio de la curvatura, o sea que cuanto más pequeño es el diámetro del ciclón más pequeñas serán las partículas que se pueden remover. El sistema de Webb usa cuatro ciclones en serie, donde la subcorriente de uno sirve de alimento para el que le sigue. Su capacidad es de 275 gpm, por el cual se logró remover más del 95% de partículas mayores de malla #100. La erosión de la máquina se evita en gran parte, empleando equipo revestido de caucho. Un aparato de esta índole, en servicio en la fábrica Grove Farm y llamado *Dorrclone*, emplea esta construcción; consta de dos ciclones en serie, y maneja hasta 280 gpm, llegando a remover en servicio rutinario de 1 a 10 toneladas de sólidos en 24 horas. La subcorriente no arrastra partículas mayores de malla #350.

■

Efecto de la Remoción de Parénquima en la Calidad de Tabla de Bagazo

K. SHEN-TU y asociados, *Informe No. 13*, Taiwan Sugar Experiment Station, págs. 209-222 (1955). Resumen en inglés.

En la fabricación de tabla dura de bagazo por el proceso convencional en húmedo, la remoción del parénquima del bagazo en bruto mejora la calidad del producto acabado considerablemente. La resistencia a la flexión se aumenta más de 28% y la resistencia a la humedad más de 37%.

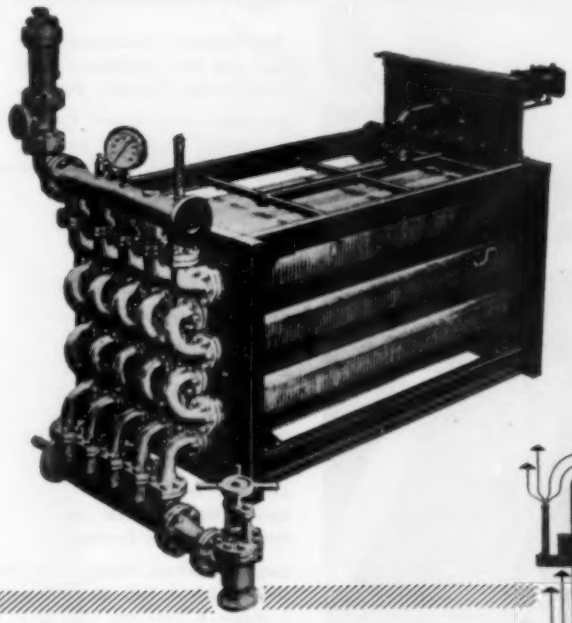
La remoción del parénquima también aumenta la resistencia de la tabla al agua, lo que puede atribuirse a la diferencia entre la estructura física del parénquima y la de la fibra limpia. El parénquima absorbe hasta 30 veces su peso en agua, mientras que la fibra limpia sólo absorbe cinco veces su peso. No obstante, este aumento de resistencia al agua será menos marcado si se trata de refinar la pasta más aún. Por ejemplo, a un grado de libertad representado por 63 segundos de "devibrador," la resistencia al agua de la tabla hecha de bagazo extento de parénquima y la de tabla de bagazo bruto son aproximadamente iguales. Por consiguiente, la remoción del parénquima es especialmente ventajosa para plantas que producen tabla dura por el proceso húmedo, donde la pasta debe tener un alto grado de libertad y al mismo tiempo tener una composición de fibra fina, a fin de impartirle al producto acabado una textura fina y alta resistencia. En plantas combinadas que producen tabla aislante y tabla dura, donde la pasta suele ser mucho más refinada, y donde se emplean aceites secantes y resinas sintéticas para darle mayor resistencia a las ligas, la remoción del parénquima no sería tan ventajosa como en plantas que emplean el proceso húmedo.

■

Efecto de la Cal y el Cobre en Suelos Ácidos

N. J. KING, *Informe*, Bureau of Sugar Experiment Stations, Queensland, pág. 24 (1956).

Un estudio de la falta de desarrollo en un cañaveral de Bundaberg reveló que el suelo acusaba una condición sumamente ácida. Se inició una serie de ensayos de campo y en tiestos con cal combinada con varios elementos menores. Con el nuevo desarrollo de la caña logrado por su reacción a las aplicaciones de cal inmediatamente aparecieron síntomas típicos de la falta de cobre. Estos se hicieron patentes por la marcada pérdida



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de tersura o marchitez de los cogollos, clorosis intravenal y especialmente por manchas sombreadas o de descoloramiento en las hojas. En los ensayos en tiestos, las aplicaciones de cobre, tanto a la tierra en forma de sulfato de cobre, como a las hojas en forma de aspersiones de quelato, produjeron un desarrollo normal bastante vigoroso.

Se realizaron ensayos de campo con aspersiones de quelato, pues esta tal vez resulte ser la mejor forma de aplicar el cobre a tierras deficientes en este elemento. Una aspersión que contenga .009 por ciento de cobre equivale a 1/10 lbs. de sulfato de cobre por acre.

Durante el año se observaron deficiencias de cobre en varios cañaverales, algunos de los cuales reaccionaron notablemente a las aplicaciones de sulfato de cobre. Un análisis químico de cañas afectadas reveló que el contenido de cobre en las hojas generalmente era menor de cinco partes por millón.

■

Acamiento y Rotura de los Tallos de Maíz

C. E. NELSON y otros, *Investigaciones Agrícolas* (Agricultural Research, U. S. Department of Agriculture), Dic. 1956.

Un estudio del acamamiento y rotura de los tallos de maíz reveló cierta información que puede ser de interés para los propagadores y cosechadores de la caña de azúcar. En este caso se sembraron parcelas de maíz de diversa densidad o población, o sea de 9,300, 12,900 y 26,200 tallos por acre. Estas parcelas recibieron 100, 200 y 400 libras, respectivamente, de abono nitrogenado por acre. Todas las parcelas fueron regadas. Se observó que tanto el abonamiento con nitrógeno como las siembras densas produjeron tallos más altos. Al mismo tiempo, el nitrógeno aumenta el grueso de los tallos y su resistencia a la rotura durante las primeras etapas de crecimiento, y cabe suponer que las fuertes concentraciones de nitrógeno ofrecerían protección contra la rutura de los tallos; pero sucede lo contrario, pues el mayor peso y bulto de los tallos en su parte superior más que contrarresta el mayor espesor en la parte baja. En las parcelas no fertilizadas de 9,300 de población, la rotura de tallos no pasó del 8 por ciento, mientras que en la población de 26,200 alcanzo el 60 por ciento. Por lo tanto, el aumento de rotura de los tallos parece ser inevitable en el caso de fuertes aplicaciones de abono nitrogenado, y esta situación parece agravarse cuanto más nitrógeno se emplea. Los trabajos de cultivo profundos, superficiales y de aporque no produjeron efecto alguno en la rotura de los tallos.

En el mes de septiembre se llevaron a cabo ensayos con maíz verde para determinar la propensidad de rotura después de que se secan los tallos. Estos ensayos encluyeron: (1) la fuerza mecáca necesaria para doblar un tallo de maíz hasta romperlo; (2) la fuerza necesaria para romper el tercer cañuto del tallo entre dos apoyos 6 pulgadas distantes; y (3) el diámetro del tercer cañuto. El segundo de estos ensayos se encontró ofrecer la mejor forma posible de pronosticar la rotura de los tallos al secarse, lo que sería útil para los agricultores y los avisaría del peligro de rotura, a la luz de lo cual podrían continuar el riego hasta mediados de septiembre para evitar que se sequen los tallos prematuramente y podrían recoger la cosecha cuanto más temprano posible.

El acamamiento y la rotura también presentan un serio problema en el cultivo de la caña de azúcar. El método de determinar la susceptibilidad a pérdidas de esta índole parece merecer la atención de los propagadores y cultivadores de caña de azúcar.

■

Acelerando la Inteligencia Azucarera

Avión Beeachcraft de dos motores recientemente agregado a la flota del Central Mercedita, Inc., Puerto Rico, fabricantes del azúcar marca White Snow y los rones Don Q y Boca Chica. Desde el año 1930, los funcionarios de esta empresa vienen economizando tiempo en sus viajes por la Isla y a islas adyacentes usando aviones particulares. La foto muestra a Bill Cantwell, piloto de la empresa Serrales, con el aeroplano Beeachcraft Twin Bonaza.

Color Para Azúcar

(Viene de la página 62)

Al trazar las curvas en el gráfico de color, los valores de color de azúcar en términos de atenuancia fueron computados por la fórmula de Adams† para diferencias de color. Para tal fin, el color del azúcar fué definido como la diferencia en color entre la solución medida y la solución de sacarosa normal incolora. La fórmula de Adams es una relación empírica que se ha usado para calcular las diferencias de color entre los colores casi iguales de dos superficies reflejadas. Aunque las diferencias calculadas para el color de azúcar no son pequeñas, la experiencia demuestra que esta no es una limitación alternativa, siempre que no se trate de diferencias mayores de 40 unidades NBS. Las magnitudes mayores se evitan, especificando la profundidad de la solución a ser utilizada en la medición.

El gráfico de color ha sido comprobado de varias maneras, y se encontró estar bastante de acuerdo con las observaciones visuales. Por ejemplo, se preparó una serie de soluciones de azúcar, y los tubos conteniendo profundidades iguales de las soluciones fueron alineados por observadores independientes en una secuencia de color decreciente. Se encontró que esta secuencia era casi idéntica a la determinada por los valores de color en unidades NBS. Un análisis estadístico de la comparación indica que los valores en unidades NBS se pueden usar con confianza en la industria azucarera para clasificar el color de soluciones de azúcar normales.

Otra propiedad útil de la nueva escala de color de azúcar es la aditividad. Esto hace posible predecir el color de una mezcla entre los colores de sus componentes.

La unidad NBS de color de azúcar se calcula de la luz transmitida solamente. Por lo tanto, en las comparaciones visuales hay que tener cuidado de tomar en cuenta la luz reflejada por las paredes del recipiente. Si se hace esto, la unidad NBS satisface la necesidad de una norma de color primaria en la industria azucarera. Normas secundarias, como cristales apropiedos, también pueden resultar útiles.

**El término* atenuancia *fué introducido en lugar de* absorbencia *para aquellas soluciones que contienen considerable materia difusora de luz.*

†Color in Business, Science, and Industry *(Color en el Comercio, en las Ciencias), y en la Industria, por D. B. Judd (John Wiley and Sons, Inc., New York, 1952).*

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PHILOLOGY and FILTERAIDS

Joseph Conrad speaks of words "debased by centuries of careless usage," and a glance in any good dictionary does show that many of our everyday words no longer have any clear-cut meaning. This is particularly true in the field of filtration, where many people become confused between filteraid quality and filteraid grade. This confusion is probably compounded by the diatomite industry practice of naming their different filteraids, rather than designating them by a simple direct-reading grade designation.

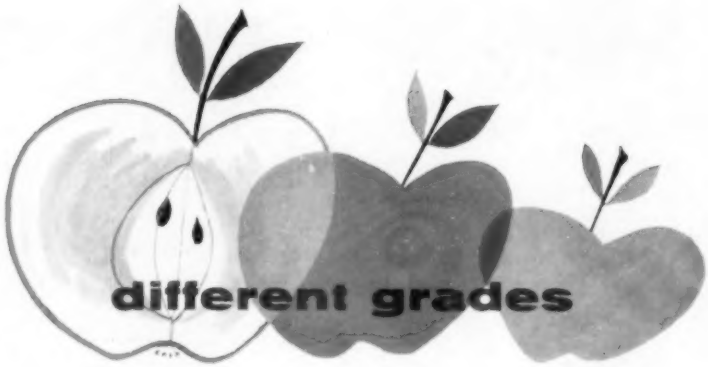
We might better talk of filteraid efficiency — the ability to give maximum throughput with consistent clarity at minimum dosage. This high performance is essential both for your product quality and to hold operating costs in line. There are many cases where the production rate of an entire plant depends directly upon the output of the filter station. And high performance is a function of *both* quality and grade.

In diatomite filteraids, quality and grade are not the same thing. Every major filteraid supplier has available a series of grades, ranging from a fine particle size grade to a coarse particle grade, with flowrate increasing and clarity decreasing as the particle size increases. This series permits matching the filteraid to the characteristic of the feed liquor.

However, filteraids from different suppliers may be equivalent in grade but vastly different in quality or efficiency. The poor quality material may develop flowrate equal to the better material but be inferior in clarity. Or, clarity may be achieved at the expense of flowrate. The most common weakness, however, of poorer quality filteraids is their inability to cope with the occasional tough batch of liquor encountered in almost every plant.

This property — the ability to handle the tough batch, at economically sound dosage — is the true test of a top quality filteraid. This characteristic is not built into a filteraid by accident. It takes sound experimental work, based on years of experience in filtration, to develop the basic information as to particle size distribution and other characteristics required in a good filteraid. And, to make this knowledge effective, quality filteraid production must be backed by control of reserves of high quality raw materials, together with milling and sizing equipment which will process the material within the very narrow limits imposed by a system of rigid quality controls. To date, this is the only known method to insure top quality in diatomite filteraids.

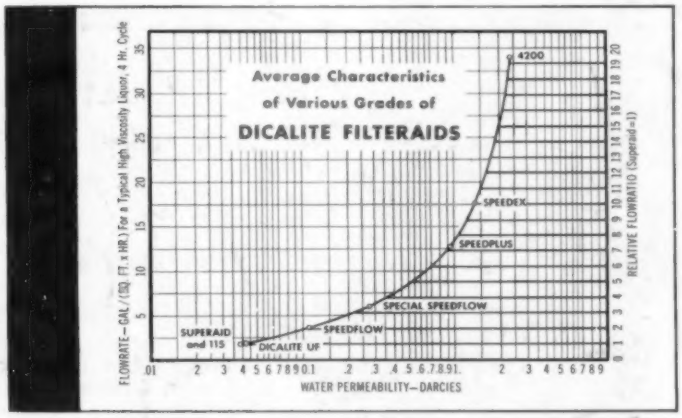
P. W. Leppla
Technical Director



...but just one quality!

Filteraids and certain kinds of fruit have this one thing in common — that *grade* is a matter of size, and has no reference to quality. The smaller fruit may be the equal of the larger in everything but size.

Filteraid quality means the highest possible degree of clarification for the grade employed, at greatest throughput per quantity of filteraid. Dicalite achieves this high quality—in every grade—by (1) careful selection of the crude diatomite from Dicalite's four high-grade deposits; (2) processing with the industry's most modern equipment, and (3) the industry's most rigid quality control system, which assures the same carefully controlled particle size range and distribution for each grade, uniformly, dependably, lot after lot. Which may explain why so many leading firms in every branch of processing have standardized on Dicalite Filteraids.



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